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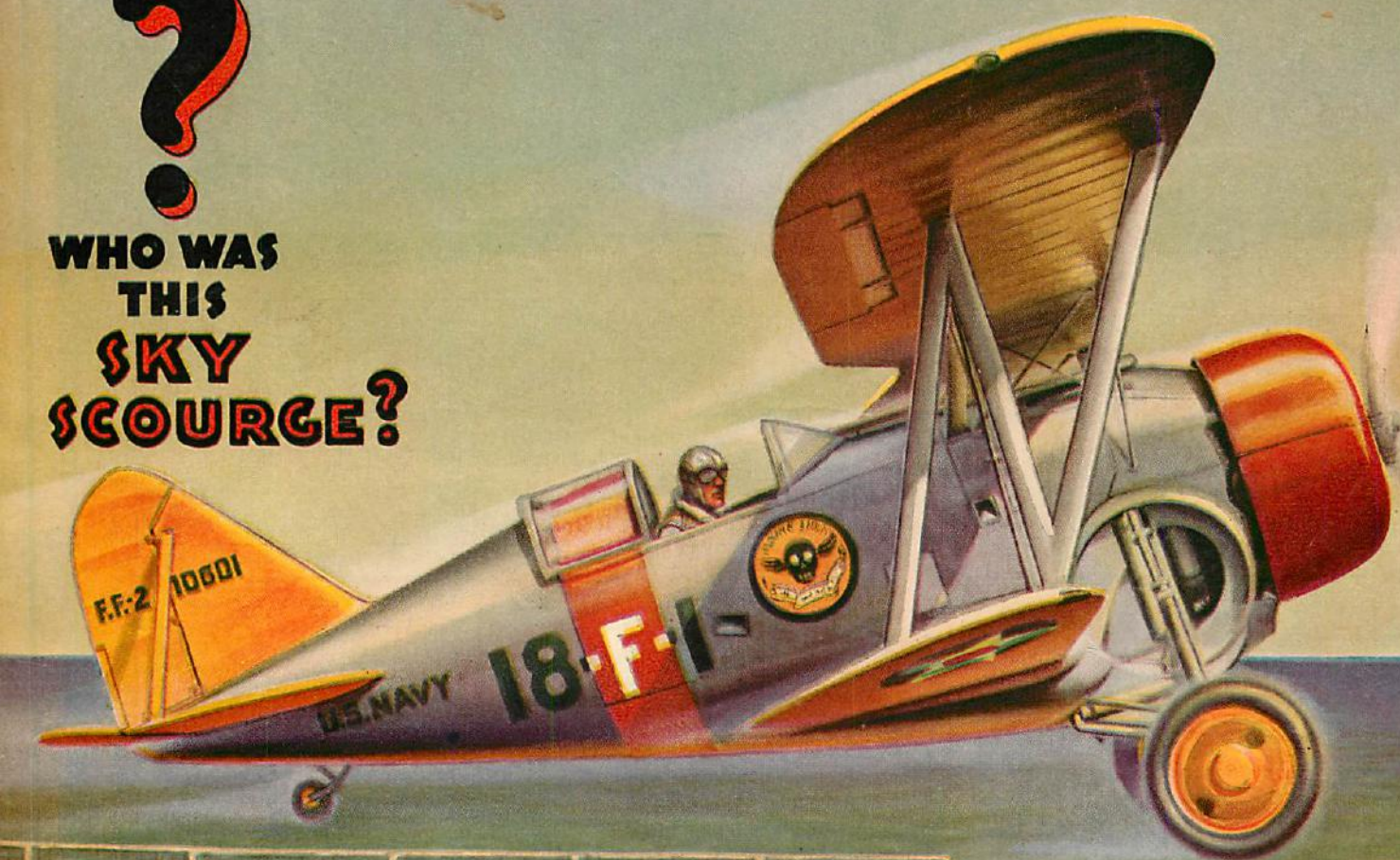
MARCH
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SILENT
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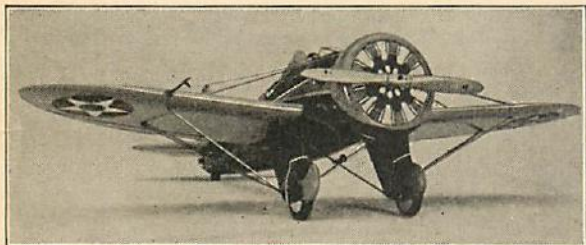
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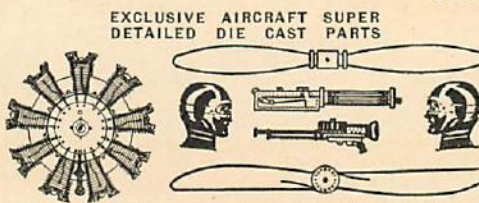
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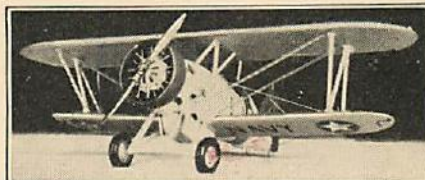


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VOL. V

MARCH, 1936

NO. 6

CONTENTS

Bill Barnes Air Novel:

THE SILENT FLEET . . . 6

*From out of the earth's depths they came—no
motor roar, no propeller shriek—to
strike with fiendish fury!*

by George L. Eaton

This Month's Features:

THIS WINGED WORLD	4
<i>The picture story of what's new in the air.</i>	
PROPELLER DEVELOPMENT	17
<i>Illustrated information for aviation students.</i>	
AIR MAIL ACES	18
<i>Fighting fog, fire, mountains in a mad, brave era.</i>	
PICTORIAL HISTORY OF MAN IN THE AIR	21
<i>More episodes for an aeronautic scrapbook.</i>	
SEE 'EM AND LEAP!	25
<i>Dizzy photos revealing a zoo at the airport.</i>	
THE GRUMMAN NAVY FIGHTER	26
<i>About the F2F-1 on the cover.</i>	
THE FLIER'S DICTIONARY	31
<i>The Airport—sixth lesson in technical terminology.</i>	
TRANSPORT, JR.	38
<i>Details and drawings of the new Curtiss 19L Coupe.</i>	
AIR TRAILS GALLERY	41
<i>A page of pictures of modern planes for the collector.</i>	
BUILDING THE BOEING P-26A	43
<i>Complete solid-model plans of a favorite ship.</i>	
DO YOU KNOW THAT—	80

Short Stories:

RAIDERS OF THE BEAM	22
<i>Along the invisible skyway lurked a deadly menace.</i>	
WINGS OF VENGEANCE	28
<i>Whirling, the figure fell. Was it to—Journey's End?</i>	

Departments:

THE MODEL WORKSHOP	32
<i>Build the "Thermal Finder" for new duration thrills.</i>	
WHAT'S YOUR QUESTION?	37
<i>Interesting answers from an expert.</i>	
AIR ADVENTURERS CLUB	42
<i>Moving the mountain—a message for pilots of to-morrow.</i>	

(Cover painting by Frank Tinsley)

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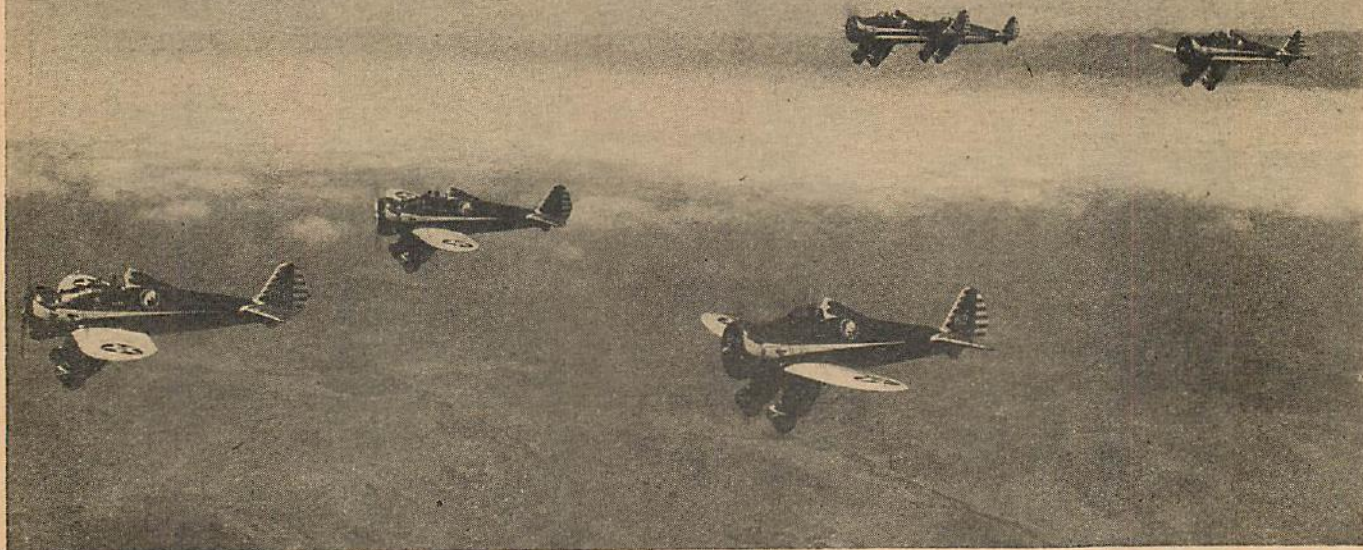
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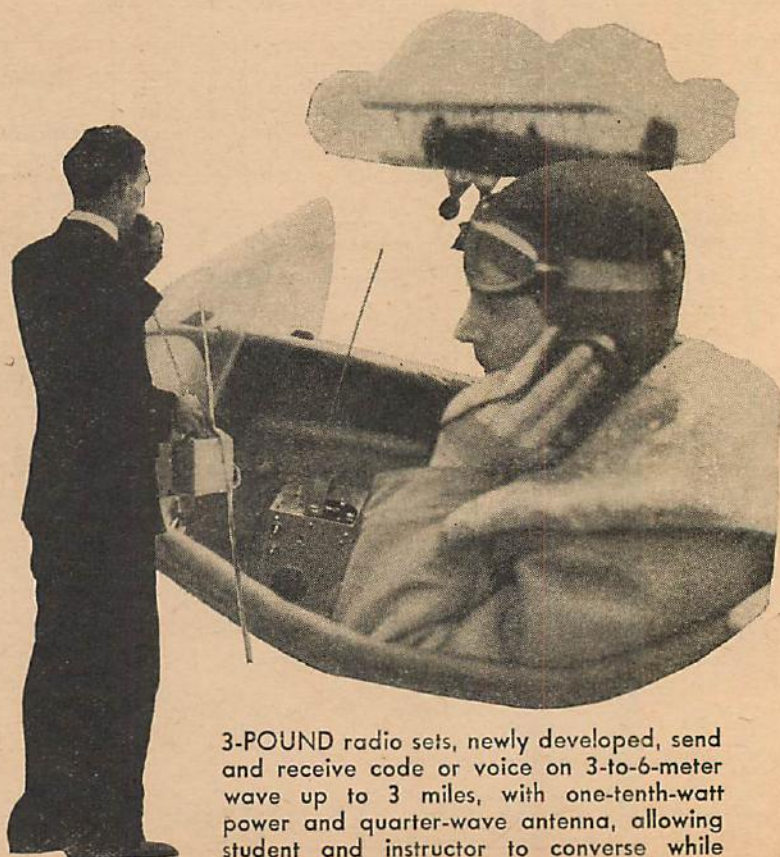


Official photograph, U. S. Air Corps

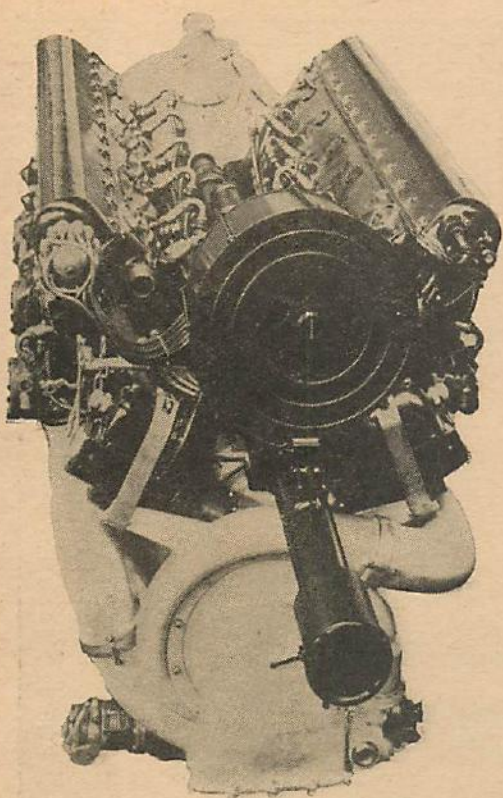
"KICKING MULES" of the 95th Pursuit Squadron illustrate the Boeing P-26A model plans given in this issue.



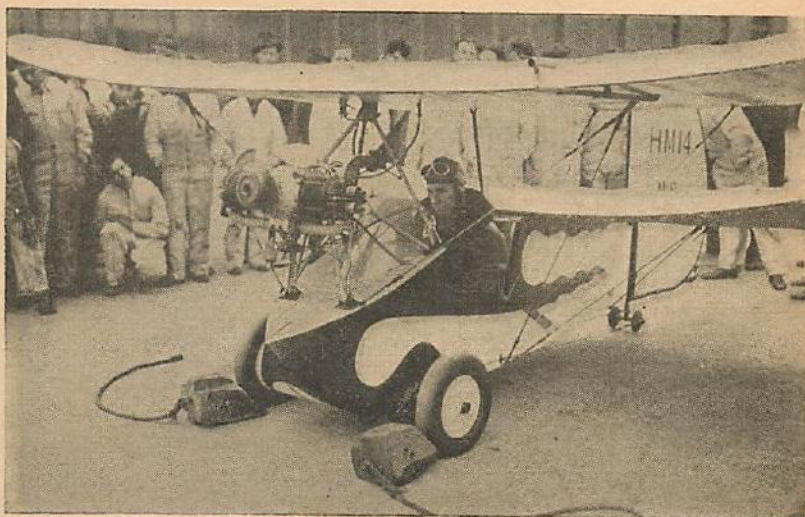
SELF-PHOTO snapped by string to camera tied on glider wing was Walter Craig's way of making this startling close-up!



3-POUND radio sets, newly developed, send and receive code or voice on 3-to-6-meter wave up to 3 miles, with one-tenth-watt power and quarter-wave antenna, allowing student and instructor to converse while instructor remains on ground.



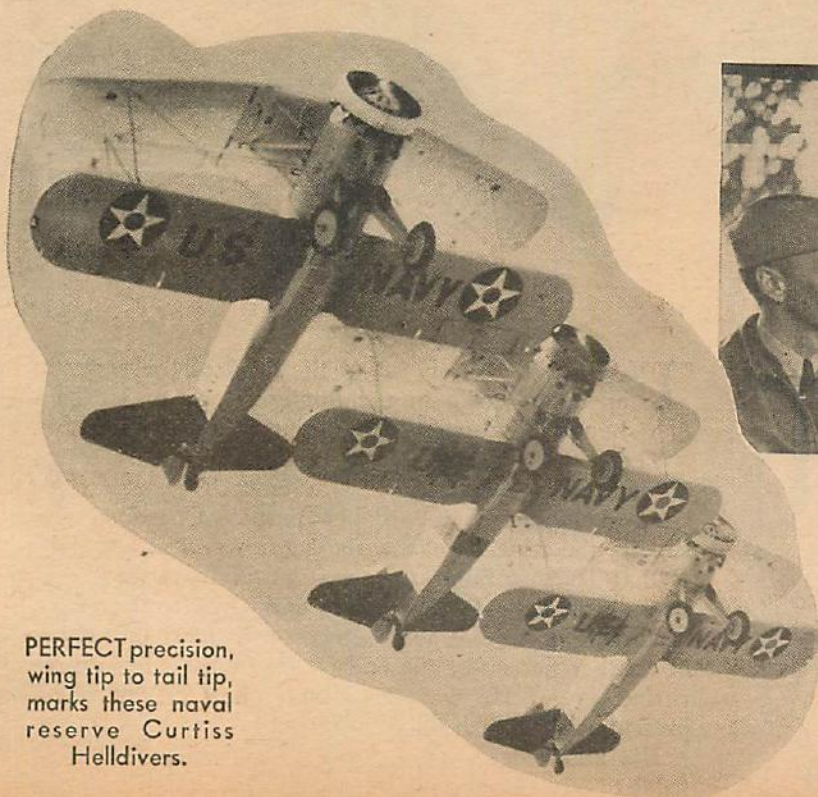
MOTOR-CANNON is fighting planes' sole hope of vanquishing speedy bombers defended by machine guns. The half-ton weight of Hispano-Suiza's 12Ycrs, geared 800 h.p. V engine, absorbs recoil of the cannon firing 280 half-pound $\frac{3}{4}$ -inch shells per minute at 500 yards through propeller hub.



CLYDE PANGBORN rides a Flea! Strange controls bothered him, he says, but he climbed 400 feet.



TIN CAN scale models are John Magarine's paying hobby. He shapes metal into tubing, using only cutting pliers and soldering outfit to construct practically every part of planes like this Curtiss Seahawk.



PERFECT precision, wing tip to tail tip, marks these naval reserve Curtiss Helldivers.



MECHANICAL "weather man" shown by Pilot Marsh and Mechanic De Gregorio, crew of army plane that carries it aloft daily for Harvard scientists, collects and radios its report every 30 seconds. The 8-inch device notes temperature, pressure, and humidity in a humming signal recorded on ground charts. Advancing weather science, it will help aviation.



The SILENT FLEET

by George L. Eaton

TAGGART BONE sat at the head of the perfectly appointed table in the dining saloon of his one-hundred-and-eighty-foot oil-burning yacht, *Priscilla*.

The four wives of the government officials seated around the table watched with envy Taggart Bone's adroit handling of the dinner party. The food was superb, the wine excellent, the service perfect. On top of that Taggart Bone's conversation and wit were positively brilliant. He was able to carry on a conversation with one person and at the same time detect the wishes of another person at the end of the table. He was the perfect host. He was the kind of host all the wives present wished their husbands were.

His knowledge ranged from mule-shoeing in the oil fields to gun-running in China, and exploration in Tibet.



And he managed to avoid the odious "I" in relating his experiences. He told them in short, concise sentences, interspersing here and there with touches of humor.

The attorney general of the United States, Everett Waters, a tall, heavy man with a shock of black, disordered hair caught his wife looking at him with an expression that was not hard to read. He knew Mrs. Waters was comparing his slow, ponderous movements of body and brain with those of their host. He flushed, wet his lips and plunged into the conversation.

"Speaking of gun-running in China," he said, with the solemnity of a supreme court judge reading a verdict, "we're having no little trouble with the smuggling of Chinese from Cuba into the United States.

"As you know, our immigration laws prohibit the entry of any Chinese into the country, except students and tourists and merchants for a limited time. But the

*From the earth's depths
they struck
without warning—
no motor roar,
no propeller shriek—
in a great
Bill Barnes novel
of gripping
air adventure!*

Chinese tradesmen and merchants already in the country need new help and are willing to pay a good deal to get it.

"There is a tong that takes boatloads of Chinese from China to Cuba. Then the same tong smuggles them into the United States using fast speed boats. It is pretty easy for them to lose our coast guard boats darting in and out of the Keys off the tip of Florida. The Chinese merchant pays the tong a thousand or twelve hundred dollars upon delivery of the man in this country. The man then has to work about five years, without pay, to reimburse the merchant."

"It must be a rather dangerous occupation," Bone said.

"It is," Waters answered, grimly. "But it is more dangerous for our men. We have lost eight men in the past few months. All highly trained government operatives. We recovered the bodies of only two of them."

"And you can't stop the smuggling?" Bone asked.

"No," Waters answered. "When we concentrate on Mexico and Cuba they begin to bring them over the Canadian border by plane. Ours is a large country."

"I could stop it!" Taggart Bone said, decisively.

Everett Waters flushed and looked at the man angrily.

"Why don't you?" he snapped. "I'll take you on as a special agent and place you in charge."

"When shall I come in to talk to you about it?" Bone asked, evenly.

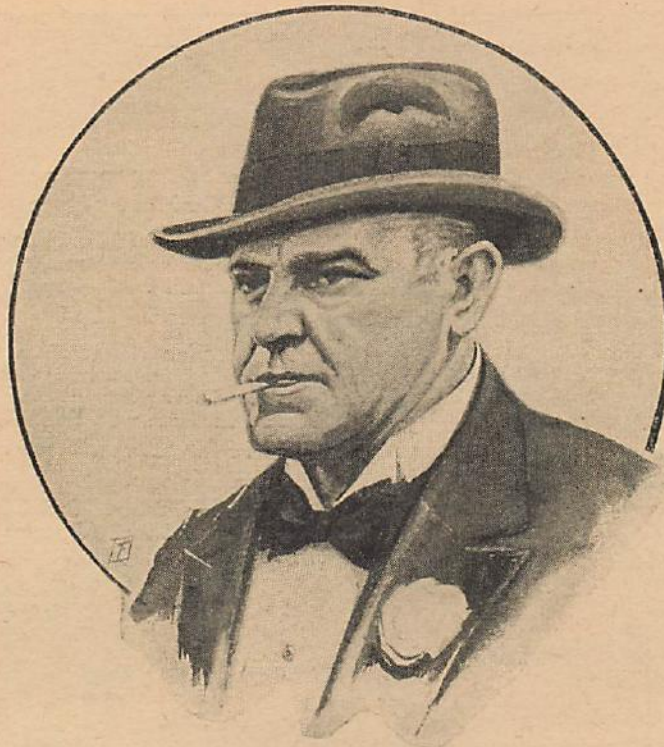
"To-morrow!" Waters growled. "I'll see you at any time convenient to you. The job also includes the smuggling of narcotics. It is no easy task to keep an eye on our enormous coast and border lines."

"Millions of dollars' worth of dope is being smuggled into the country annually. Right now we're fighting a losing battle with the toughest, deadliest bunch of smugglers we've ever had to deal with. Our men have laid trap after trap for them. But they have managed to outwit us. They're no ordinary bunch of gangsters. They rely on brains as much as guns."

"For instance, we have certain information that a plane will leave Cuba to-night loaded with Chinese and dope. We even know where it will land. But I am not at all certain our men will capture it. This gang of smugglers has an uncanny way of learning what we are going to do."

"If all of your men talk as readily as you do," Taggart Bone said, smiling, "it is little wonder."

Some one at the table gasped audibly at the audacity of Bone's remark. All eyes were turned on Everett Waters' crimson countenance. For a moment he glared at Taggart Bone as though he intended to leap from his chair and strike him. Then he managed to twist his



Taggart Bone

lips into a smirk that was half smile and half sneer.

"I am taking it for granted," Waters said, "that I am among people who do not consort with smugglers."

"That," said Taggart Bone, "is a reasonable supposition. I'll come in to see you to-morrow. I think I might be able to work out a plan."

At ten thirty Taggart Bone stood on the main deck of the *Priscilla*, bidding his guests good night. Attorney General Waters followed the secretary of war down the brass-railed steps to the waiting launch. Before he stepped into the launch he called back to Bone: "I'll expect you over with your magic wand to-morrow."

"I'll be there," Bone answered.

He waved a hand in farewell as the launch pulled away from the *Priscilla*.

Attorney General Waters, seated in a comfortable chair on the after deck of the launch, grunted but did not return the salutation. Riding low in the water, the *Priscilla* was as spick and span and trim as an English greyhound. But there was no appreciation of her beauty in the eyes of Attorney General Waters as his gaze swept over her.

"That man," he said, turning to the secretary of war, "is the greatest ass and egoist it has ever been my misfortune to meet."

The secretary of war smiled under the cover of darkness, but did not reply. He could understand why Waters felt as he did about Taggart Bone. But he did not agree with him. He was of the opinion that Bone was an unusually brilliant man. It was little wonder to him that the President, himself, consulted Bone on matters of importance.

"Where," Waters asked, irritably, "did the man come from?"

"That," said the secretary of war, "is a question no one seems able to answer. It is said that he made an enormous fortune in oil and emeralds in South America. He is a man of mystery. He is not unlike that wealthy European who appeared from nowhere, yet had a finger in the affairs of the world. And then, disappeared from a plane one night while flying across the English Channel."

"He has been decorated by two or three nations and was awarded the Perry gold medal by the International Research Society for his explorations. He cruises around the world in that yacht, touching at every known, and some unknown, ports."

"Is he an American?"

"I believe he was born in Texas."

"I haven't any use for these mystery men," Waters said, childishly.

"He says he can clean up your smugglers," the secretary of war pointed out.

"They're much more apt to clean him up," Waters replied. "They're a bunch of ruthless killers with unlimited resources at their command. The smuggling of dope into the country has become a grave question. Not only are they smuggling in dope, they are sending trained men among school children all over the country teaching them to use their dope. It's a horrible thing. We're trying to keep the facts away from the public. Trying to clean it up without publicity, fearing that publicity will make even more children curious about the use of dope. But it is getting away from us. It is a gigantic organization. The most dangerous evil in the annals of crime, because it is taking its roots right in the foundation of the country."

Inside the high walls of a garden restaurant at the end of the Prado in the city of Havana an orchestra played soft, soothing music. In the center of the restaurant a fountain sprayed its cool waters on the beautiful flower beds surrounding it.

But the sharp little men of every nationality moving from table to table, closing deals, persuading, promising, discussing sailings and prices had no ears for the soft music, or eyes for the beautiful flower beds.

They were carrying on a barter in human beings and arranging with photographers to take photographs of their aliens, the photographs to be attached to forged passports, in case of trouble.

Outside the city of Havana the human beings in which they traded were bartered in rude little huts smelling of fish and opium. Some of them had been there for six months, in abject misery, waiting for their turn to come. Waiting for the night to come when they would be slipped aboard a fast express cruiser and raced through the Caribbean across the Gulf Stream to the Florida Keys under the cover of darkness.

On this night three men, evil in their dark eyes and dissipation stamped on their swarthy features, sat about a table pouring drink after drink down their throats. They had finished with their business for that day and had rolled down the tops of their invisible desks. They knew that in the morning, if all went well, they would collect their share of the proceeds from smuggling Chinese and a quarter of a million dollars' worth of opium into Florida via the air route. They were well satisfied with the deal and they were getting drunk over it.

But one hundred miles north of Havana the swarthy-faced pilot of the speeding transport plane carrying those

twelve Chinese and that quarter million dollars' worth of opium was learning things over his radiophone that would have caused those three in the restaurant no little anguish.

"Dump all of them—all your cargo," a voice was saying into the pilot's ear phones.

"On what authority?" the pilot said into his microphone.

"This is Q-2 speaking," the voice came back. "The order comes direct from Q-1. Proceed to Miami and be sure there is no evidence aboard."

"All clear," the pilot answered. "Q-12 sending—all clear."

The pilot locked his controls, stepped out of his chair and went back into the main cabin of the twelve-place ship. He went back and leaned over the ugly-faced man who was in the last seat and was half asleep, and had an automatic strapped around his waist.

"I just had word to dump our cargo," he said in the man's ear. The ugly-faced man opened his eyes wide. His mouth became a jagged curl across his face.

"Q-2 just made contact," the pilot said. "Order direct from Q-1. That's tops. Let's get busy."

His face was white as he gazed out a window into the blackness of the night. It was a job he didn't like. But it had to be done. If a man wanted to stay out of jail he couldn't afford to be squeamish. With no sign of regret, he gazed at the twelve fear-crazed Chinese. They were just so many animals to him. No, not animals. A man got fond of a dog or a horse sometimes.

"We're over Marquesas Keys," he said to the ugly-faced co-pilot and guard. "As good a place as any."

The guard worked one of the side doors, on which a special mechanism had been arranged to open it against the force of the wind.

Without speaking a word he reached for the collar of the nearest Chinese. Before the man was aware of the co-pilot's intention he had been thrown bodily through the door of the speeding plane.

As the co-pilot reached for another one the man's eyes rolled back into his yellow skin. As he began to scream the guard landed one terrific blow on his jaw. The man's head sagged forward. The guard whipped his body forward and threw it into space.

The other ten Chinese were going crazy now. They knew what was going to happen to them. They had heard tales of whole shiploads of Chinese being thrown overboard when there was danger of capture. They had heard such tales. But they had never believed they were possible. Now they knew.

The scene that took place in the cabin of that transport would have burned itself into the mind of the average man so deeply that he would have gone through



Adrian Temple



life seeing it. He would have dreamed of it at night and would have heard the shrieks of those Chinese by day all of his life.

But the two thugs who beat and kicked and shot those twelve Chinese through that door into space were not men. They were fiends. They were such things as you read about, but do not believe. Half of the Chinese they had to shoot and beat insensible before they could dispose of them. But the Chinese had been taken by surprise. Most of them were hurtling through the air to their death before they realized what was happening to them.

The guard closed the door and wiped the blood off his face and hands. He looked at the transport with an expression of disgust on his face. "Now we've got to clean all this up before we sit down at Miami," he said. "What was the chief's idea, anyway?"

"He had word the coast guard and G-men were waiting for us," the pilot answered. "They knew where we were going to land."

"Well, it was the chief's dough we threw overboard," the guard said. "He ought to know what he wants to do with it. But I wish he had to clean up this mess."

II—ENEMY THREATS

TAGGART BONE removed his panama hat, exposing a head of iron-gray hair, as he entered the office of the attorney general of the United States the next after-

noon. His clothes were draped on his powerful body as only a Bond Street tailor can drape them. His gray eyes were smiling with his lips when he shook the hand Everett Waters extended.

"I thought you might think better of your offer of last night," Waters said.

"I'm still of the same opinion," Bone answered. "What report did you get on the smuggling plane you expected to land last night?"

Waters' face became clouded. He muttered something under his breath before he spoke to Bone.

"They fooled us again," he said. "The plane landed at Miami with only the pilots aboard. We know for a fact that it set out from Cuba with twelve Chinese aboard. But they weren't there when it landed. It didn't put in where we expected it to, either. They were warned in some way and got rid of their cargo."

"How many people knew where it was going to land?" Bone asked.

"Barely a dozen government men, and the officers of a coast guard cutter."

"Who owns the plane?"

"It is licensed in the name of the man who was flying it. But that doesn't mean anything. It's one of a great many owned by a dope ring. Probably the largest dope ring in history. We don't know who heads it, whether

it's a syndicate or an individual. We have picked up a few of their men, but we've never been able to get anywhere with them. They don't know themselves where their orders come from. It seems to be an endless chain with no one able to follow the links back to the beginning. Even the men who peddle the dope don't know where it comes from."

"Maybe I can figure it out," Taggart Bone said quietly. "I've handled such things before."

"I'll give you a chance to try," Waters said grimly. "But you'll have to work with our men. We're calling in another outsider, also. He has had remarkable success in the past ferreting out criminals. We have called him in several times and he has never let us down."

"That," Bone answered, "is still a secret. You will know that when the rest of the world is informed."

Waters shrugged his shoulders impatiently.

"You don't object to working with Barnes, then?"

"Not in the least," Bone answered. "I would like the opportunity. I am a great admirer of Barnes."

"Fine," Waters said. "I am going to turn you over to James Morton now. Morton is the chief of the bureau of criminal investigation. You know of his ability, of course."

"Quite well. He and his men have done some nice work."

Bill Barnes' bronzed face wrinkled into a smile of amusement as he listened to the tall, suave man who sat across the room from him.

Then he got to his feet and moved across the living room of his bungalow with the grace of a jungle cat.



"That," Taggart Bone said, evenly, "would be Barnes—Bill Barnes?"

Taggart Bone's eyes were not smiling now. They were hard and cold as Waters gazed into them with an expression of surprise on his face.

"You startled me for a moment," Waters said. "I've told no one I intended asking Barnes' help."

"Every one knows his reputation," Bone said. "He is the only logical person to ask for aid in a case of this sort."

"What about yourself?" Waters asked, smiling.

"I mean, besides myself," Bone answered coolly.

"You seem to think rather highly of yourself, Bone," Waters said, still smiling. But his smile was more sardonic than pleasant.

"I have reason to think well of myself," Bone replied. "I have succeeded in doing what I set out to do in the past. I have succeeded as a soldier of fortune, an industrialist, a banker, an explorer, and as a scientist."

"Just how as a scientist?" Waters asked. His voice had taken on the same childish tone he had used talking to the secretary of war the night before.

Most of them were hurtling through the door to their death before they knew what was happening to them.

FINLEY

He pushed back a curtain and gazed out across Barnes Field, past the administration building and the traffic tower.

"As I understand it," Bill said, his blue eyes still gleaming with amusement, "you'll pay me half a million dollars if I don't take on the next job offered to me. And if I refuse your offer and take the job you promise that I'll be killed."

"That isn't just the way I put it," the tall man said, "but that's what I meant."

"But I haven't even been offered the job yet."

"It will be offered to you within twenty-four hours," the man said.

"And has to do with what?" Bill asked. Adding, "By the way, I didn't get your name when the guard brought you over."

"Temple," the tall young man said. "Adrian Temple."

Bill nodded his head, but did not offer to shake hands with the man. Bill liked his appearance and his apparent frankness. Yet, some inborn instinct warned him to tread easy. It was an instinct he had learned to respect, so he respected it now.

"I don't know what the job will be," Temple said, answering the question Bill had asked a few moments before. "I am merely here as an intermediary. I don't even know who my principal is. A lawyer came to me and asked me to come to you. He told me just what I have told you: that you would be offered a job which you would probably be inclined to accept within the next day or two. He said the man he represented would pay you two hundred and fifty thousand dollars when you refused the job and two hundred and fifty thousand a month from now. The second two hundred and fifty thousand to be held in escrow by any one suitable to you."

"That," Bill said, "is about the strangest proposition I've ever received. Who was the lawyer?"

"I don't know that," Temple said. "I only know what I've told you. All I know is the name of the lawyer, who practices in Washington."

"Then what makes you think the offer is sincere? That your lawyer friend would ever come through if he had to?" Bill asked.

Temple flushed, reached into an inner pocket and brought out a wallet. From the wallet he extracted a single one-thousand-dollar bill and held it out for Bill to inspect.

"That," he said. "That is what made me believe he was sincere. That is the fee he paid me for just laying the proposition before you."

Bill whistled.

"Win, lose or draw, eh?"

Temple nodded his head and stuck the bill back into his wallet.

"Well, at least you win a thousand bucks," Bill said. "But that's all you win. You can tell the lawyer to tell his principal that he has only made me curious. There is something phony about the offer. Honest money doesn't come at a half million a clip with the stipulation that I do exactly nothing to earn it. When you get money that way it's hot money. Bribery. It's the kind of money I don't care to touch."

"That's final?" Temple asked.

"That's final," Bill repeated, firmly, his blue eyes no longer amused.

"Then I have one more thing to tell you," Temple said. "I was instructed to tell you, in case you refused

that you will not live for another forty-eight hours. That that was one thing you could depend on. And he said it wouldn't be a pleasant death."

Bill Barnes' mouth became a thin, straight line across his face. His eyes narrowed until they were mere slits of fire. The muscles in his cheeks bunched as his hands clenched tightly. An expression of fear danced across Temple's face, but was gone as quickly.

"He asked me to make one more plea to you after I had told you that," Temple said quickly. "He said if you refused that last plea it would be too late."

Bill paced the length of the room and back again.

"You're not going to tell me anything more?" he asked Temple, quietly.

"There's nothing more to tell."

"Then you'd better get out, Temple," he said. "You'd better get out before I decide to do something about—about what amounts to a threat on my life. I don't like threats. I don't like threats, and the kind I like least are anonymous ones. Get out!"

Temple's suave and pleasant manner disappeared as his mouth twisted into a sneer. He put his hat on his head at a rakish angle and shrugged into his topcoat.

"Barnes," he said, unpleasantly, "you're a sap. You're trying to stretch your luck. This time the dice are loaded against you."

He turned the knob of the door leading from Bill's living room into the hallway as Bill whirled, his mind a maelstrom of thoughts. Should he hold Temple? Should he— The door banged behind Temple. Bill jumped for the telephone on his desk. He dialed a number and listened impatiently for the answering buzz. A voice sounded in his ear.

"Yeah, Bill," the lazy voice of Tony Lamport, the radio chief on Barnes Field, came to him.

"Connect Shorty, quick!" Bill ordered.

"Right, Bill," Tony said. "He just checked in."

"Shorty" Hassfurter, a round-faced man of thirty-eight who looked thirty-two, wrinkled his blue-gray eyes as he pulled his topcoat off his stocky form and picked up the telephone.

"Probably that good-looking blonde with the million dollars in the bank," he said to "Red" Gleason, a carrot-topped Barnes pilot who had been Shorty's pal since 1917, when they were flying Spads and S. E. 5s over the German lines.

"Yeah," Red grinned. "She probably wants to give you half of it."

"Are you there?" Shorty said into the mouthpiece, his blue eyes smiling.

"Listen, Shorty!" Bill's voice came back to him.

The smile disappeared from Shorty's eyes and his body tensed. He knew when Bill spoke that way that things were going to happen.

"I want you to get out to the Wauchuck Road gate as fast as you can. I've phoned the guard to hold up a man named Temple until you get a look at him. He's driving a closed car, the guard tells me. Take my car and follow him. Find out where he goes and to whom he talks. Then telephone back. Got it?"

"Got it, Bill," Shorty said. "That's all?"

"That's all," Bill answered. "Learn everything about him you can."

"Shall I take Red with me?"

"No," Bill answered. "I'm expecting some trouble. Red had better stick around."

III—FIVE TO ONE

BILL BARNES paced back and forth the length of his living room, his hands thrust deep in his jacket pockets, his forehead furrowed. He was going over and over the meager information Temple had given him a few minutes before.

There was one bit of consolation from the man's visit, he mused. At least he had been warned. He could expect trouble. He stopped his pacing and picked up the telephone again. When Tony Lamport came on the wire he spoke brusquely into the mouthpiece.

"Tell Scotty MacCloskey," he said, "to double the guards. Admit no one through the gates until you have

"That all, Bill?"

"Yes—or nō, it isn't. Tell Scotty to check over the bomber, also. Be sure her guns and ammunition are all right. Also the fuel. Better warm her up a little, too. That's all, Tony. Let me know the minute Shorty calls in. I expect to hear from him before long."

Bill sat down at his desk and began to draw designs on a white pad of paper. He made a sketch of a twin-motored, center-wing, cantilever monoplane without knowing he was doing it. Thoughts marched through his mind like a division of infantry. Company after



Shorty caught him with a smashing right.

company, regiment after regiment, brigade after brigade.

He knew that trouble was coming. He could feel it in his bones. The way old sailing men could tell when a storm was brewing. Some of them turned up a storm in one manner, some in another.

He thought of all the other times trouble had flown over Barnes Field. Most of the times it had come without warning. A sudden, unexpected blow

in the dark of night. A blow that had brewed caldrons of death and destruction, leaving dead men in its wake.

He sickened a little as he saw visions of dead and dying men. Men with their heads torn off by machine-gun fire. The twisted, torn bodies of things that had been men.

Now it was coming again. Some malignant force was brewing evil. Some force that would have to be crushed as a poisonous insect must be crushed.

The telephone on his desk rang. He snapped off the combination ear and mouthpiece and glued it against his face.

"Bill speaking," he said. There was a strained, tense quality to his voice now that had not been there an hour before.

"Tony," came back. "Sandy just made contact. He says he's taking the Eaglet off the field at Cleveland in a few minutes. Wants to know if there are any orders."

"Just the ones I gave you before," Bill said sharply. "Tell him to take it easy and keep his eyes open."

He slapped the instrument back on its hooks and took to pacing the room again. This was one of the times when he had to be on his feet, or riding one of his ships.

checked with Scotty. Tell him to check the Scarlet Stormer and three new Snorters and warm 'em up, fully equipped. Have them on the line ready for action if we need them. Tell the sound detector men to keep on the job, a continual shift."

"What's on the fire, Bill?" Tony asked quickly.

"I don't know," Bill said. "I'm just getting ready."

"Just in case, eh?"

"Just in case," Bill repeated. "Where is Sandy? Have you had any report from him? He was going to leave Cleveland sometime this afternoon. What about Bev Bates and Cy Hawkins?"

"Cy just checked in a few minutes ago," Tony answered. "He's in his rooms. Shall I put him on?"

"No. Just tell him to stand by. What about Bev?"

"He's still in Boston, you know, Bill. Shall I try to contact him and order him back?"

"Contact him and tell him to be ready to hop if he gets orders. Tell Red the same thing. Try to pick up Sandy and order him back here as soon as possible. Tell them all to keep their eyes open."

He could think better when he was in action. His fists were clenched and crammed into his jacket pockets again. He paced back and forth, savagely, like a caged lion that is waiting to be fed.

Suddenly, he ripped off his jacket. He tore off his slacks and heavy brogans. In fifteen minutes he was attired in a light flannel shirt, flying breeches and boots. He couldn't stand around waiting for something to happen. He would go and find it even if he didn't know where to look.

The telephone rang again as he was strapping a heavy automatic around his waist. He snatched it up and growled into the mouthpiece.

"I'm sending over a kid with a telegram, Bill," Tony said.

Bill slapped the receiver back on the hook without answering. He was working himself into the frame of mind a prize fighter attains just before a fight. He wanted to get into the ring and get the thing over with.

He tore open the telegram after the boy had gone and glared at it. Then he read the thing over twice.

NEED YOUR AID AGAIN STOP MATTER OF VITAL IMPORTANCE STOP PLEASE LEAVE FOR TORONTO IMMEDIATELY WITH AT LEAST FOUR OF YOUR MEN AND PLANES STOP YOU KNOW I DO NOT ASK FOR HELP UNLESS I NEED IT STOP

The telegram was signed with a single word, "Steel." But to Bill that was enough. Old Cyrus Steel, his father's friend and his friend, was in trouble. On two previous occasions Bill had taken his men to the rescue of Steel and his far-flung interests in the North country. The last time it had nearly cost Bill and his men their lives. A vision of the mad doctor who had tried to jump Steel's valuable claims flashed through his mind. A mad doctor who had used his medical skill to attain his ends—and cost him his own life.

For the third time he got Tony Lamport on the telephone.

"Get Toronto on the telephone," he instructed Tony. "When you get them find Cyrus Steel. His office or his home should know where he is. Tell them who is calling. Get Steel on the wire personally and tell him I'll be in Toronto with my men within two and a half hours. Got it?"

"Got it, Bill." Tony's voice was vibrant with excitement now.

"Get Sandy on the radiophone and tell him to cut north to Rochester. He'll reach there before we do. Tell him to sit down at the airport and I'll contact him. Get Bev and tell him to join us over Albany in an hour. Tell him I'll contact him, too. Tell Scotty to run the Stormer and two Snorters out on the line. Tell Red and Cy I'll be ready to shove in five minutes. Usual equipment. That's all, Tony."

So, Bill thought, somebody is gunning for old Cyrus Steel again. That was the job Temple had warned him about. What was old man Steel mixed up in now? It must be something in keeping with the rest of his colossal fortune if his enemies would pay a half million dollars to keep him, Bill, from going to his aid.

This was the kind of fight Bill liked. The kind of fight where he could help a friend and at the same time stamp out some poisonous growth that was a menace to decent men.

Cy Hawkins, a lean, leathery-faced Texan who spoke with a slow Southern drawl, but moved with the speed of a rattlesnake, was already in the cockpit of his new-model Snorter and jazzing the engine when Bill walked onto the apron.

Beside him, Red Gleason's carrot-topped head, covered with a white helmet, poked out of the cockpit of a second Snorter.

The sleek, streamlined two-seaters were fresh from the paint shop. Their enameled flanks gleaming in the sunlight, the powerful, double-motored amphibians flaunted their scarlet, black and yellow markings. On the sides of each ship, just below the cockpit, were stenciled the individual insignia of its pilot.

Red turned a grinning face in Bill's direction as Bill stopped to talk to that dour old major-domo of Barnes Field, "Scotty" MacCloskey.

"What's the excitement, boy?" Scotty asked.

"Cyrus Steel again," Bill answered grimly. "I don't know what is wrong. But it's something serious. He doesn't call for help unless he needs it. He's not the kind to play wolf."

"That he's not, boy," Scotty said. "I'll be anxious to hear from you."

"I'll get in touch with Tony from time to time. Keep a heavy guard on the field until I get back. I don't know what is going to happen. Whoever is after Steel may come after us if they know Steel has asked us for help. Tell Tony to contact me the minute he hears from Shorty. When Shorty comes back here tell him to stand by with a Snorter warmed up at all times."

"Good luck to you, boy," Scotty said as he shook Bill's hand.

"The transport is O. K.?" Bill asked as he slid into the tiny cockpit of the red-lacquered Scarlet Stormer and reached for the throttle.

Scotty MacCloskey's reply was drowned out by the roar of the two twelve-hundred-horse-power Diesels in the nose of the Stormer. The two, three-bladed controllable-pitch propellers, turning in opposite directions, became invisible disks.

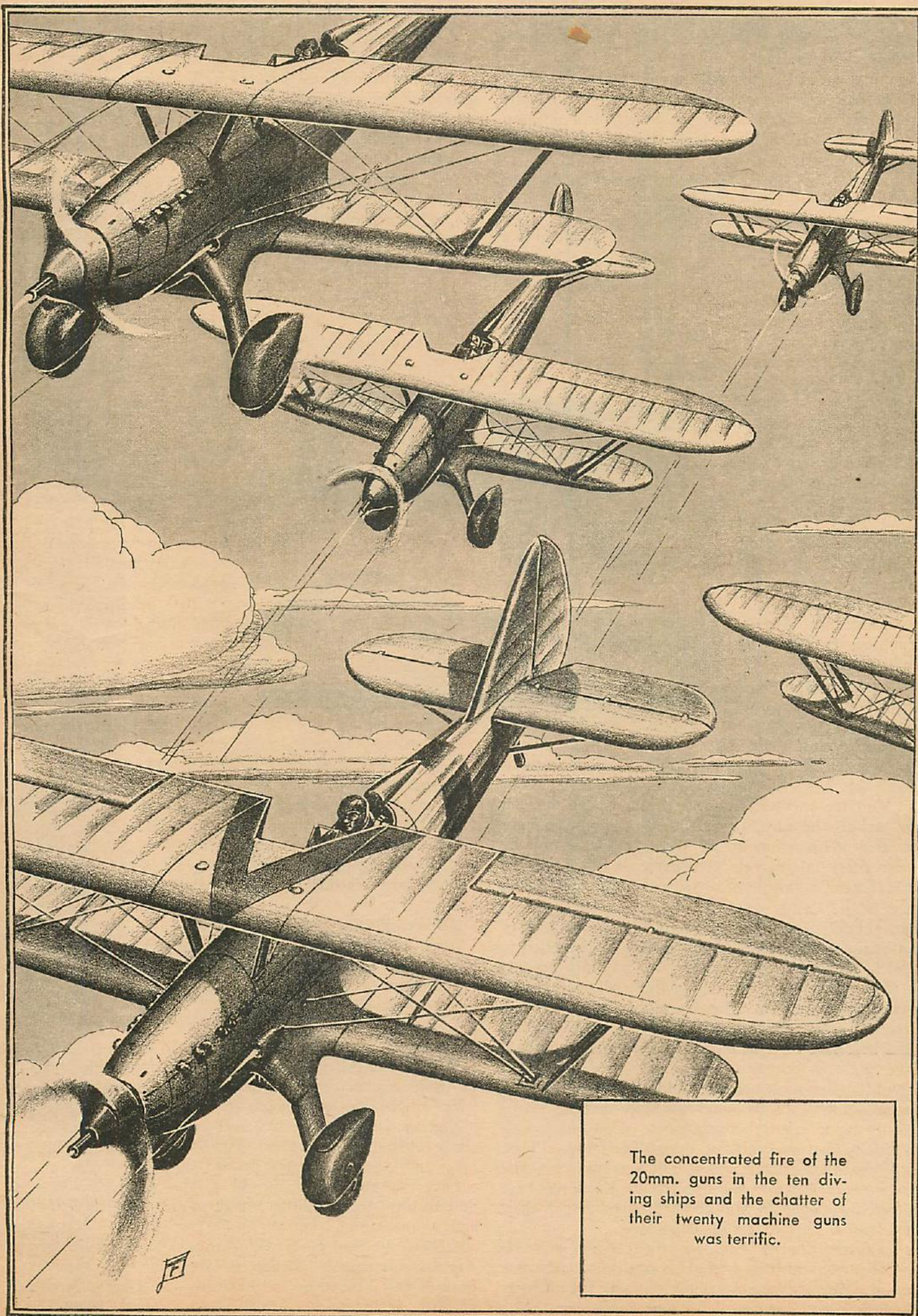
Bill threw a hand above his head as a light flashed in the traffic-control office. Cy Hawkins released his brakes as he pushed his throttle forward. He kicked his rudder and steered his fast-moving Snorter onto the main runway, heading due south. Transverse bands of yellow and black pigment flashed under his wings as his wing flaps came down and the tail came up. He eased the Snorter off the concrete in a long, low climb as Red Gleason took his ship down the same runway with the speed of a runaway locomotive. The sun gleamed brightly on the lacquered surfaces as he kicked the ship into the air with his usual grace and recklessness. As Bill nosed the Scarlet Stormer slowly toward the runway, Red joined Cy Hawkins at five thousand feet.

Bill flipped his radio switch and spoke to Cy and Red. "Get up to ten thousand. Just cruise along on each side of me at two hundred," he ordered. "I suppose Tony told you where we're going."

They said he had.

"Keep awake," Bill finished. "A bird working for Steel's enemies told me the dice were loaded against us this time."

Red Gleason laughed into his microphone. "That's the kind of dice I like," he said. "I can get more shoes for baby when the other guy thinks his dice can talk."



The concentrated fire of the 20mm. guns in the ten diving ships and the chatter of their twenty machine guns was terrific.

Shorty Hassfurth took a good look at the tall, carefully dressed man talking to the guard at the gate on Wauchuck Road and faded back behind the windshield of Bill Barnes' roadster.

His muscular hands gripped the wheel of the roadster tightly as the other car proceeded through the gate. Shorty threw the roadster in gear and took a position about two hundred yards behind the closed car, and held the same speed.

He managed to slip by a couple of red lights that might have caused him to lose sight of the car in front, praying that he wouldn't hear the blast of a traffic officer's whistle behind him. His luck held good all the way up Long Island and across the Queensboro Bridge.

It never entered his mind to question the orders Bill had given him so peremptorily. For that matter, it never entered the mind of any of Bill's pilots to ask questions. They heard the order and they executed it. They knew an explanation would come along in due time, when there was time to give it.

Before the closed car turned into Fifth Avenue and headed south it came to a halt before a drug store on a corner. Temple alighted, then looked around him carefully and entered the drug store. As there was no place to park, Shorty drove up alongside the closed car and peered inside the store. He saw Temple enter a telephone booth. A few minutes later Temple came out and headed the car toward Fifth Avenue. At the end of the Avenue he turned west on Washington Square North and continued west on Waverly Place until he had crossed Tenth Street. He drew in alongside the curb in front of a three-story stucco building and locked his car.

Shorty waited until he had entered the front door of the café on the first floor of the building. He smiled to himself as he locked Bill's car. He remembered this place only too well. It was one of those places that had been known as "Luigi's" before repeal. No one had ever spent much money here. Two glasses of Luigi's needled beer had been about all the average man could stand.

Temple was passing through a door into a little room behind the bar. Shorty bought a glass of beer at the bar and took it into the back room. Four men with broad, flat faces were in the room besides Temple. They were sitting in twos at the little tables, talking in lowered voices. As Shorty entered they stopped talking. He could feel their eyes on him as he dropped into a chair and reached in a pocket for his cigarettes.

As he lighted the cigarette he swept the room with his eyes. He knew immediately that he was in a tough spot. All of the occupants were watching him with the intensity with which a cat watches a mouse. And there wasn't

anything particularly tender about the way they looked at him.

When he lifted his glass to his lips he saw that one of the men was shutting the door. He swung around so that his back was against the wall. Two more of the men were rising from their chairs. As they came opposite Shorty they made a lunge at him. They made no sound to indicate what they were going to do; they just did it.

As Shorty ducked under those first two terrific blows he broke his glass against the wall and raked his hand upward in a fast, vicious move. The jagged ends of the glass tore along the face of a man who had just raised a welt on Shorty's eye. He was driven back into his chair. The man raised his hands to his face as it became a crimson mass.

"That," said Shorty to himself, "will be Number One." He came out of his chair and caught another one with a right that had the weight of his whole body behind it. The man's head snapped back; his feet left the ground and he, literally, sailed into a corner.

Then something exploded on the side of Shorty's head and drove him to his knees. He felt feet and fists driving into his body as he pushed himself upward. It seemed to him that a thousand fists were pounding into his face at

one time. He faded away against a wall, tried to hold them off while he picked spots to land his punches. They were cursing now, with a low intensity and ferocity that made his blood run cold. He tried to raise his voice to shout as something exploded on his head again. He felt his face plunge into the floor and managed to raise his body so that he was on his hands and knees.

"Don't kill him!" he heard a voice say.

Then he didn't hear anything. The whole world exploded. He slumped down, burying his battered face in the sawdust on the floor.

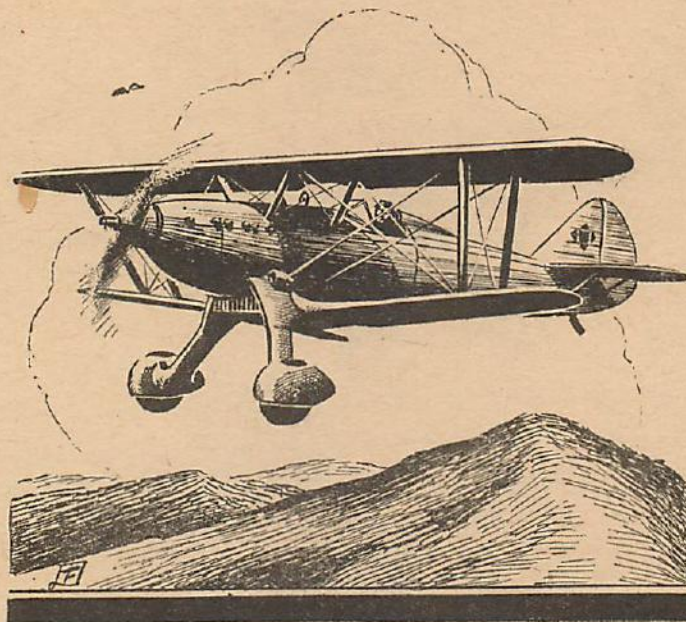
IV—TRICKED

BILL BARNES was distinctly conscious of a surge of pride and elation as he made contact with young "Sandy" Sanders, the kid ace of his outfit.

Only a couple of hours had passed since the tall, suave Adrian Temple had come to him to buy him off. In those two hours he had disposed of Temple, received a request from old Cyrus Steel for help, and had welded his little squadron together, ready for action.

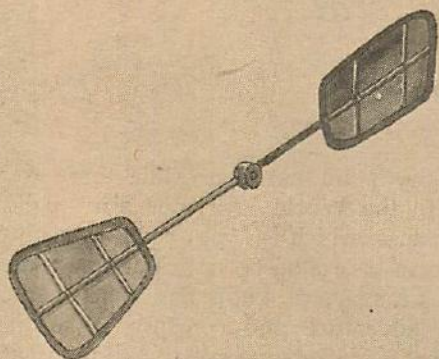
"That," he said to himself, "is what it takes in this day of superspeed. Distance means nothing, time a great deal. You've got to be ready to strike while the old iron is hot."

(Turn to page 44)

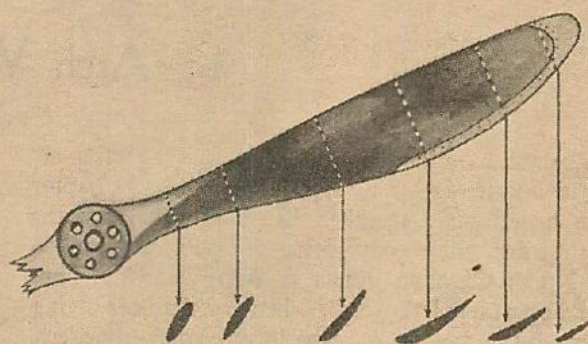


The Marvin Mystery cannon ship.

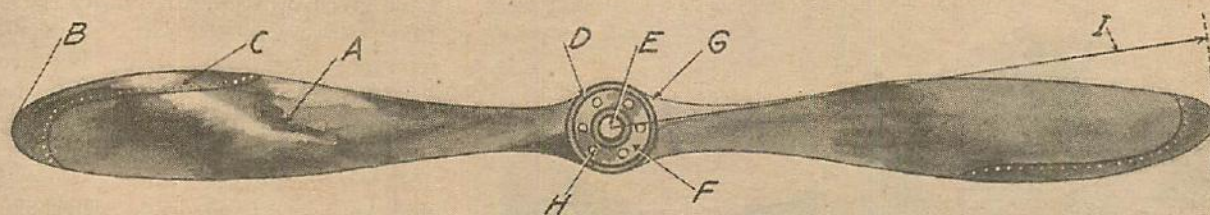
Propeller Development



EARLY PROPELLERS
WERE MADE OF CLOTH-
COVERED WOODEN OR
WIRE FRAMEWORKS.



WOODEN PROPELLER
OF WARTIME, SHOWING
BLADE CROSS SECTIONS



PARTS OF A MODERN WOOD PROPELLER -

A - BLADE
B - TIP
C - TIPPING

D - HUB
E - HUB BORE
F - HUB FLANGE

G - BOSS
H - BOLT HOLE
I - TIP RADIUS

PROPELLER BLADES ADJUST HERE



A MODERN ADJUSTABLE STEEL PROPELLER
WHOSE BLADES MAY BE CHANGED IN PITCH.
THERE ARE OTHER TYPES WHOSE PITCH IS
CHANGED WHILE IN FLIGHT EITHER BY THE
ENGINE ITSELF AUTOMATICALLY, AS A NEW
FLYING CONDITION ARISES, OR BY HAND.

Air Mail Aces

Thrilling episodes from the unwritten history of a brave, mad era!

by Arch Whitehouse

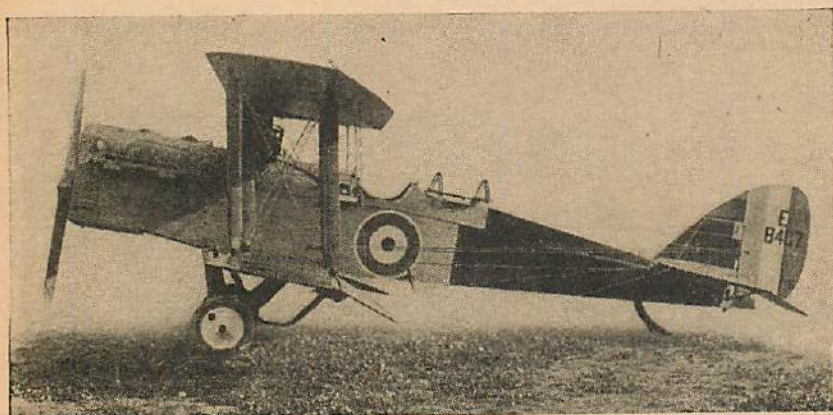
THE romantic and adventurous history of the air can be divided into four separate chapters. Chapter One began on December 17, 1903—the day the Wrights first flew their contraption of linen and bamboo over the North Carolina dunes at Kitty Hawk. That 50-second hop started the era of heavier-than-air flying which brought with it gayly-colored knickerbockers, reversed golf caps and “flying exhibitions” around race courses that had been designed for horses. The chapter neared its end with Louis Bleriot’s amazing 23-mile flight across the English Channel on July 25, 1909.

Chapter Two began on August 1, 1914 and ended on November 11th four years later. The World War era

Britain. They point out that while there were many Americans in the World War, our airmen did not fly American planes, which is about equal to asking a cowboy to perform his round-up duties astride a mule.

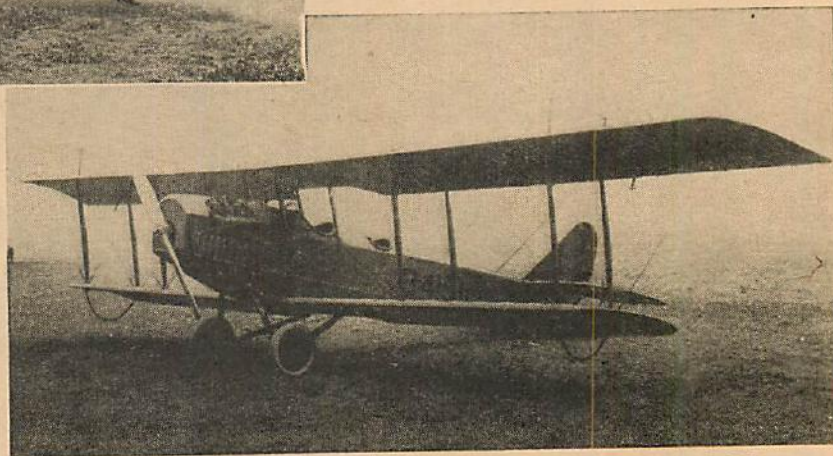
Be that as it may, we know now that Chapter Three in aviation adventure and romance is so thoroughly American that it is likely to become an important chapter in American history. We refer to that hair-raising period of sky-punching that saw the birth of the air mail. It started with a bang on May 15, 1918, a few months before the war ended, when the first air mail route was opened between New York and Washington. Even this historical point is as dizzy as the air mail era itself, for

no one seems to be able to make up his mind just who flew the first bag and we have given up trying to answer the question. At any rate, the first regular service was started on this date. The air mail era ended only recently, with the retirement of the last open cockpit plane, a little Pitcairn Mailwing, from service. Full ceremonies, including a brass band and speeches from Eddie Rickenbacker and others, marked the occasion.



D. H. 4s were the first mail planes. Here's one still flaunting its war paint.

did many things to aviation. Some have said that it made the airplane, while others declare that the changes developed in war skies were really military advances and in no way actually improved man's ability to fly. At any rate, it brought the deadly romance of aerial combat and glamorous fighting airmen, who for a short space of time were young gods in the eyes of the world. More stories have been written about war-time flying than any branch of any service in any army. While the World War provided amazing adventure for thousands of young men, I have been told by men in the publishing business, who should know, that war flying adventure has never really won the devotion of the American youth. They say that it all happened too far away and that American airmen were not in it long enough to absorb the spirit of air warfare and bring it back to this country, as it was in Germany, France, and Great



Liberty-powered, like the D.H. 4, the "Jenny" served faithfully.

Chapter Four is unfolding to-day—the commercial era of high-speed transports, instrument flying and long-distance over-water flights on regular schedules. There is romance in it, but the boys of the war and air mail years don't think so. It's a business, and there's no sentiment or romance, they feel, in modern business.

If you have any doubts about adventure in the air mail days, just turn back the pages of aviation history

Air Mail Aces

*Thrilling episodes from the unwritten
history of a brave, mad era!*

by Arch Whitehouse

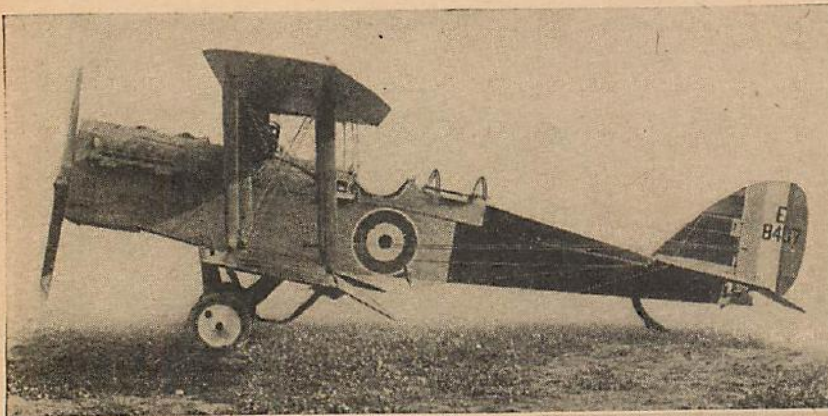
THE romantic and adventurous history of the air can be divided into four separate chapters. Chapter One began on December 17, 1903—the day the Wrights first flew their contraption of linen and bamboo over the North Carolina dunes at Kitty Hawk. That 50-second hop started the era of heavier-than-air flying which brought with it gayly-colored knickerbockers, reversed golf caps and “flying exhibitions” around race courses that had been designed for horses. The chapter neared its end with Louis Bleriot’s amazing 23-mile flight across the English Channel on July 25, 1909.

Chapter Two began on August 1, 1914 and ended on November 11th four years later. The World War era

Britain. They point out that while there were many Americans in the World War, our airmen did not fly American planes, which is about equal to asking a cowboy to perform his round-up duties astride a mule.

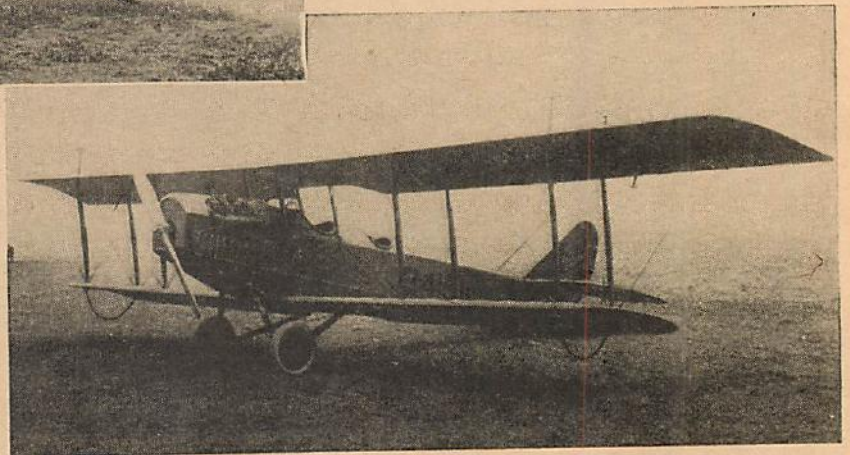
Be that as it may, we know now that Chapter Three in aviation adventure and romance is so thoroughly American that it is likely to become an important chapter in American history. We refer to that hair-raising period of sky-punching that saw the birth of the air mail. It started with a bang on May 15, 1918, a few months before the war ended, when the first air mail route was opened between New York and Washington. Even this historical point is as dizzy as the air mail era itself, for

no one seems to be able to make up his mind just who flew the first bag and we have given up trying to answer the question. At any rate, the first regular service was started on this date. The air mail era ended only recently, with the retirement of the last open cockpit plane, a little Pitcairn Mailwing, from service. Full ceremonies, including a brass band and speeches from Eddie Rickenbacker and others, marked the occasion.



D. H. 4s were the first mail planes.
Here's one still flaunting its war paint.

did many things to aviation. Some have said that it made the airplane, while others declare that the changes developed in war skies were really military advances and in no way actually improved man's ability to fly. At any rate, it brought the deadly romance of aerial combat and glamorous fighting airmen, who for a short space of time were young gods in the eyes of the world. More stories have been written about war-time flying than any branch of any service in any army. While the World War provided amazing adventure for thousands of young men, I have been told by men in the publishing business, who should know, that war flying adventure has never really won the devotion of the American youth. They say that it all happened too far away and that American airmen were not in it long enough to absorb the spirit of air warfare and bring it back to this country, as it was in Germany, France, and Great



Liberty-powered, like the D.H. 4, the "Jenny" served faithfully.

Chapter Four is unfolding to-day—the commercial era of high-speed transports, instrument flying and long-distance over-water flights on regular schedules. There is romance in it, but the boys of the war and air mail years don't think so. It's a business, and there's no sentiment or romance, they feel, in modern business.

If you have any doubts about adventure in the air mail days, just turn back the pages of aviation history

and you will find the announcement that the post office department decided to issue a medal for gallantry in the air where safe conduct of the mails was concerned. It is known as the Air Mail Flyers' Medal of Honor. It was instituted as a national decoration during the last Hoover administration, and Mal B. Freeburg, who was then connected with the Northwest Airways, was officially awarded the first honor medal to be struck off.

Freeburg, the *beau ideal* of the air no matter how you look at him, has a remarkable record as a transport pilot. Here's the trick that won him the first air mail medal.

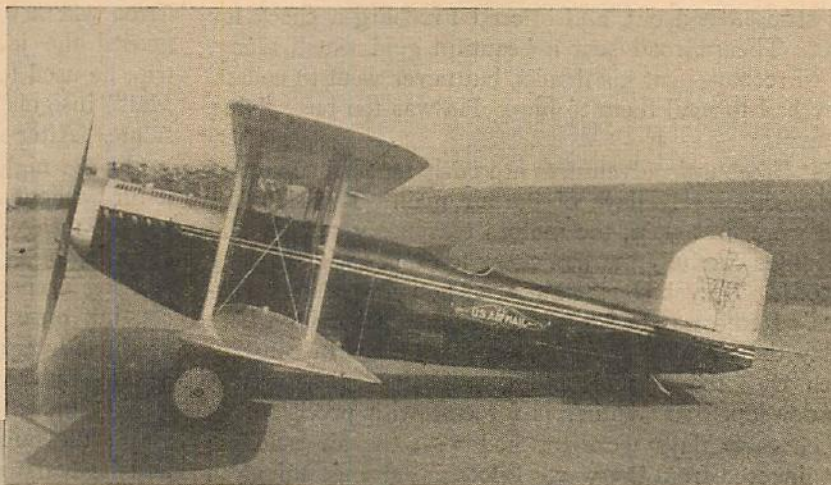
He was flying a Ford tri-motor job over Wabasha, Minnesota, along the Northwest Airways route one night when the ship began to do a wild fandango.

Steadying his craft, which was carrying considerable mail and eight passengers, Freeburg called his base at St. Paul. His conversation ran something like this:

"Freeburg calling. Plane No. 187.

That was all. They heaved a gigantic sigh of relief.

Later on they learned that Freeburg had maneuvered his crippled ship out over the Mississippi River when he saw that it was certain to lose a motor. He reassured his passengers, rolled the Ford over into a steep bank, and with a sudden jerk of his control wheel and the throttles of the two remaining engines, he forced the disabled motor loose and saw it plunge 3,000 feet



The M-2, slightly faster. Both Douglas mail planes used the 400 h.p. Liberty.



Douglas' M-1 was a civil version of the army's O-2.

Over Wabasha. Starboard propeller broken."

The officials of the line saw black headlines, a gruesome crash, possibly the end of the line. They could do nothing but run around in circles. Young Freeburg flew straight on.

Then came another message from Freeburg's muzzle-mike:

"Freeburg again. Motor vibrating badly. Looks like she's coming clean out of the spider. Have to do something about it. Will report later."

The voice of the airman was cool, remarkably cool. It settled matters in the control tower at St. Paul. The officials sat down and waited.

For ten minutes they waited, sitting on tenterhooks. They could see in their mind's eye the great motor trembling, dancing, jerking, ripping out connections, copper tubes and electric cables. That motor weighed 500 pounds. Suppose it fell! A 500-pound missile hurtling toward the sleeping villages below! It would have crushed the average home to splinters.

Then in a minute the calm, cool voice of Pilot Freeburg came to them again:

"Freeburg reporting. Engine all clear. Heading for company emergency field. Have relief ship waiting. Passengers all O. K."

and hit with a mighty splash in the Mississippi.

Then with rare delicacy he maneuvered the Ford back into normal flying position on the two remaining engines and a badly damaged wing. For twenty-five miles he flew her and finally set her down on the emergency landing field with the aid of his own parachute emergency flares.

The passengers did not know what had actually happened until they were being transferred to another plane. Freeburg

apologized for being an hour late—but he was two months late to get his Air Mail Medal! He was always too busy flying the mail to get to it.

There is more to the Freeburg log. A short time before the Ford motor episode, he was flying across Minnesota one night when he noticed an important railroad trestle burning on the C. B. Q. Railroad where it crossed the Chippewa River. Freeburg stared down at it and then remembered that he had passed the night express of the line hurtling down from Minneapolis. It was heading at breakneck speed toward a bend in the line that hid the burning trestle from view.

"The mail must go through!" was the air mail pilot's creed, and Freeburg realized that any effort he might make to save the train would probably prevent him from keeping his schedule and jeopardizing the line's contract with the government. The twist to the situation lay in Freeburg's realization that if his line lost the mail contract, the railroad whose night express was thundering along below him to its destruction would probably get the mail contract instead.

But there was no time to question business points. Nosing down like a bullet, Freeburg screamed over the burning trestle first to make sure that it was really on fire. Then, satisfying himself that there was real danger,

he flew along up the tracks toward the oncoming express. He dropped his landing flares directly on the tracks and so blinded the engineer that he was unable to see the block signals ahead. Naturally the engineer slowed down and in doing so, eased around the bend and saw the burning trestle in time. Freeburg ignored his own danger in risking a possible emergency himself without a landing flare of any sort in his tubes.

The Chicago *Daily News* printed the story, once it was straightened out, and offered Freeburg a check for \$100. The railroad sent a beautiful gold watch along, too. Freeburg sent his thanks, but never went to collect. They had to mail them to him. He was too busy flying the mail.

But Freeburg's adventures are fairly modern compared to the wild, early days of the air mail. The ships he used were first class, the motors reasonably reliable and the routes carefully marked every ten miles with flashing beacons. They had real airports, not cleared cow pastures. Radio was steadily improving to the point where to-day the Knights of the Muzzle Mike are in constant touch with the ground, and the meteorological system has developed so weather is forecast with precision.

The early days were touched with the air madness that lingered from the war. Pilots did strange things to relieve the comparative security of mail flying. There were no skulking Huns to worry about, no Archie shots, no hackle-itching formations to keep. In addition they were getting a small base pay and additional fees for day or night mileage. As long as you flew you made money, but as soon as the fog, sleet, snow or rain slipped in, the bank-roll dwindled. Consequently they were eager to take off again as soon as they could, come heaven, hell or high water.

No wonder the early days of the air mail provided so many amazing adventures.

They flew old D.H. 4s with the "renowned" Liberty engines. They flew in and out of anywhere under almost any conditions. At the beginning, soon after the war, there was no seat-pack parachute. They didn't come into universal use until some time in 1923, almost five years after the war ended.

Pilots crashed everywhere. They hit everything from haystacks to towering industrial chimneys. But somehow the mail went through—a bit scorched perhaps, but safe.

Those were the days of helmet and goggle pilots who wore the old war-time Sidcot suits and fur-lined flying boots, and emerged from their ships looking like something from Mars. To-day, air mail pilots sit in comparative comfort wearing neat blue suits and saucy navy-type caps.

A pilot who is well known to me, but whom I shall call Fred McHugh, took off one night from Cleveland

to Newark. He had 900 pounds of registered mail in the compartment of his old Douglas. The 390-mile trip took him across the Pilot's Graveyard, as the route over the Allegheny Mountains was known. It was easy to fly over "the hump" in the daylight. All you had to do was to follow the line of crashed planes or hook in with the black spots that represented the final resting places of many a flamer.

Freddie McHugh had imagination, and he often wondered whether this mail business was worth it. But he needed the job. Whenever he was reluctant about a trip, he used to go over to his plane, stare at the "U. S. Mail" insignia painted on the side, click his heels and salute. After that he would climb into the cockpit.

On the night in question, Freddie might have called it off without feeling that he had let Uncle Sam down, for the meager weather reports from Newark were not encouraging. There was bad weather upstairs, and rain and fog drenching the Cleveland field. He had a radio set, but once he had taken off, hoping to find a hole at the other end over Newark, the set went dead, of course, and he was entirely on his own.

He climbed to 12,000 feet to make certain he would clear "the hump," but ice began to form on his wings and he had to go down, risk bashing into a mountain.

For four hours this nerve-racking flight went on, and he seemed no nearer a hole than he was when he started. Four hours at 115 m.p.h. and no sign of Newark. The instruments danced, strange gusts hit the ship. And below him nothing but a thick blanket of fog.

Freddie McHugh *might* have said: "No use. Might as well turn inland again and take to the silk. What does 900 pounds of mail mean in my young life?"

But he didn't. He took another look at his fuel gauge and took a chance. He nosed down, down, down. Then

he eased out, glad to be alive, and pulled a parachute flare toggle. The white ball of fire showed nothing but the enraged rollers and whitecaps of the Atlantic Ocean!

"Whew! Where the devil did I get to?" he asked his reflection in the instrument dials.

He turned westward again and sought land. For nearly an hour he raced on. At last he caught a dim, flickering light. He eased in gently and discovered that it was the

friendly beam of Montauk Light out on the tip of Long Island.

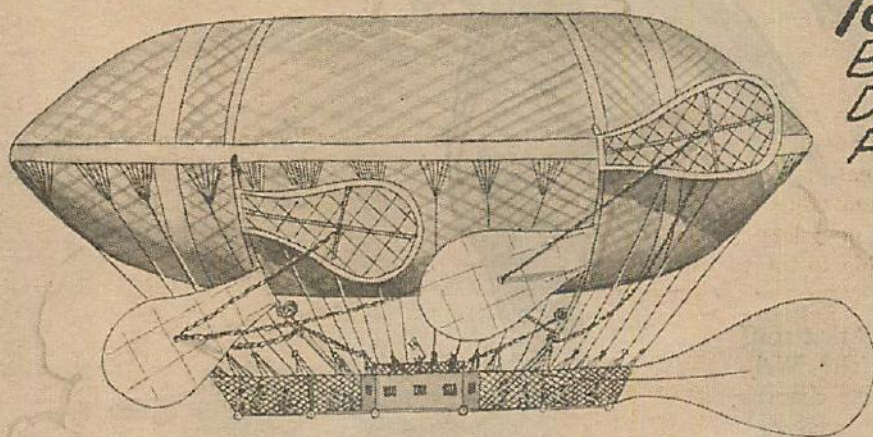
He might have bailed out then, for the fuel gauge showed zero. But he circled the light twice and hoped for a break. The break came in the most unexpected manner. It sounds like fiction, but it was fact.

A member of a village fire department was air-minded enough to realize what was happening. A fire alarm was sounded, and as fast as the volunteer firemen responded they were sent out to the North (Turn to page 76)



Boeing's 40-B4 launched the modern era in 1927. The pilot still sat outside, but four passengers and mail rode snugly.

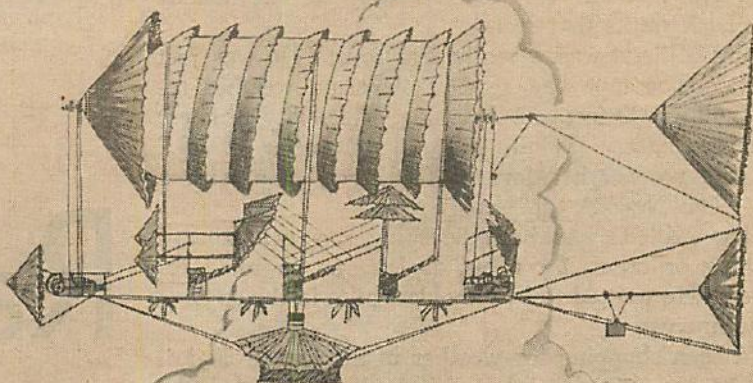
Pictorial History of Man in the Air



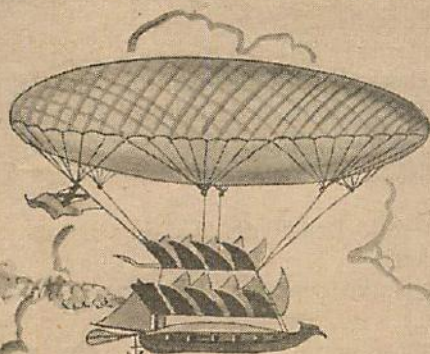
1835 "THE EAGLE," BUILT BY COMTE DE LENNOX, IS PLACED BEFORE THE PUBLIC. ITS WORLD CIRCLING FLIGHT FAILED.



1835 JOHN WISE, OF PHILADELPHIA, STARTS HIS 40 YEARS' AS THE PREMIER AMERICAN AVIATOR. 440 FLIGHTS



1835 PIERRE FERRAND, OF FRANCE, INTRODUCES HIS AMAZING REVOLVING DIRIGIBLE PROPELLER.



1837 SIR GEORGE CAYLEY PRESENTS THE FIRST INTERNALLY BRACED AIRSHIP. THIS WAS ONE OF THE MOST IMPORTANT OF ALL EARLY IMPROVEMENTS IN AIRCRAFT DESIGN AND CONSTRUCTION DETAIL.

SPRING MILLETTS came out of the met. office at Chicago into the damp night air with a completed flight plan in his hand. He had a cold scowl across his broad, handsome face, which was unusual for Spring Milletts.

Dale Crowell, the hostess, caught it at once and glanced up briefly at the business office of the big Gordon air liner that stood at the platform.

"You're taking her, aren't you, Spring?" she asked anxiously.

"What do you care?" Milletts growled back.

"But Dick—his mileage—He needs another four hours."

"So I should hump this cow through that stuff up there, just to get him co-pilot time, eh? Well, I'm not sure I'll do it. It's crazy to take chances like that."

"But Dick won't get another chance for a Newark run until Thursday—you know the routine. He only needs four hours to get over. They're putting No. 704 into service on Friday for the holiday runs. Dick wants that seat."

Spring Milletts wasn't really that sour. He was just cautious. The tape had read: "Cleveland weather report: Ceiling 900 feet and dropping. Visibility 2 miles; thickening haze. Wind NE3. Barometer 29.19." That was no weather for air transport, even with a beam. The Newark tape was worse.

Spring Milletts had been humping this run, aboard something or other, for about as long as he could remember. He wanted to be the oldest pilot in the game—not the bravest.

He'd been shopping for weather in the meteorological office, hoping for a break. After all, he needed the money—mileage money, not just base pay. But there was reason in everything.

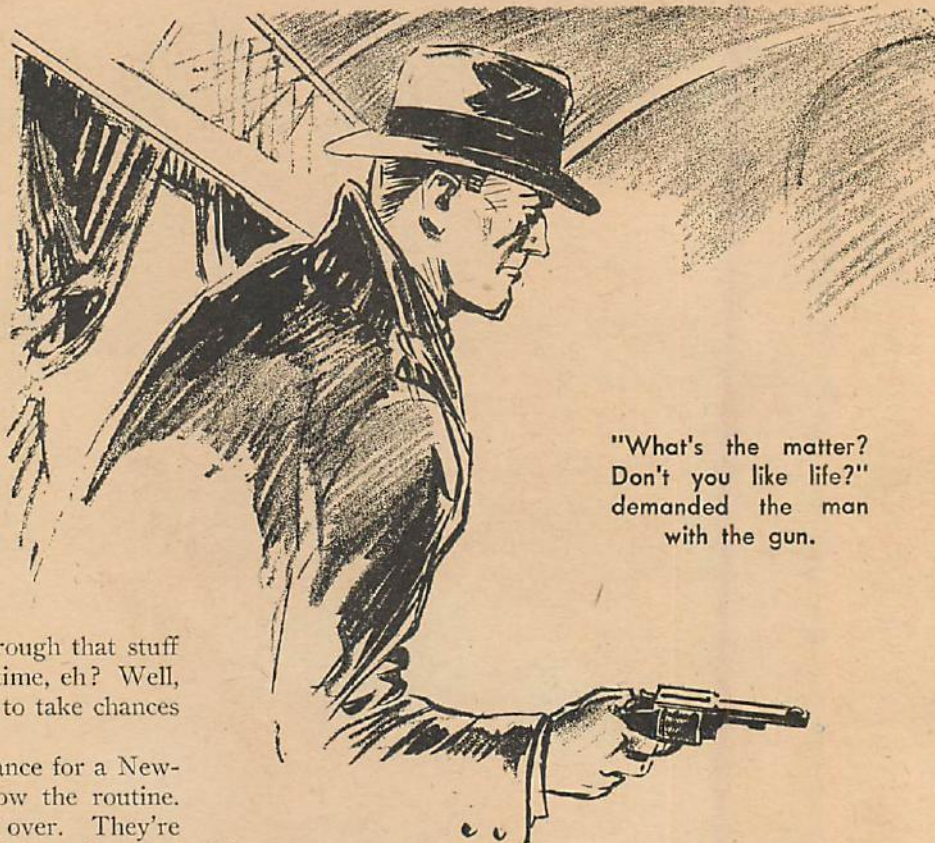
"Ceiling 900 feet—and dropping!" he snarled under his breath.

There was a D. of C. law that forbade attempting a landing through anything under 500. He wasn't throwing his ticket away for any hostess—even though she did look like something that had escaped from Park Avenue. And as for Dick Thurlen, he'd have to wait for that extra four hours that would complete his co-pilot time.

"We can cut across from Sandusky to Pittsburgh and avoid that low-pressure area," Miss Crowell reminded. "Then you can take the Harrisburg beam through into Newark."

"Providing we can find Pittsburgh—and then Newark," growled Spring. "Look here, I'll do the planning on this run. I happen to be the pilot. You take care of your lunch boxes."

Miss Crowell, completely subdued, went back into the cabin and readjusted a few headrest napkins that were already perfectly smooth. Up front she could hear Dick Thurlen making a test on their day frequency with the line dispatcher.



"What's the matter? Don't you like life?" demanded the man with the gun.

by Ken
Martin

Raiders of

*Along the invisible trail
line through the night, ruth-*

"Plane No. 702, Chicago, testing. Go ahead," chanted Thurlen into the mike.

In his ears buzzed: "Chicago to Flight 9. O. K."

Then Dick checked with the control tower: "Plane No. 702 to WEEH. What's the wind? Go ahead."

"WEEH to No. 702. Wind S6. Use runway No. 3."
"O. K. WEEH. . . . We will if Milletts goes. How's traffic?"

"Dud from here to Bellefonte. Getting that extra section run, Thurlen?"

It was Baxter, the operator. He was interested in young Thurlen.

"Need four more hours. Looks like Blaine will beat me to it. He gets a western run on Flight 4 in the morning."

"Too bad, Dick. Like to see you get it. Sorry. O. K., go ahead, Cleveland."



the Beam

*that guided the great air
less treachery lay in wait.*

Dick Thurlen listened in while the Cleveland operator chanted the bad news from the east.

"Visibility zero, all trips cancelled——"

"Damn!" spat Thurlen, flicking off the switch above his head and hanging up his hand mike.

He peered out of the window and saw Spring Milletts talking to a dispatcher who had a manifest sheet in his hand. A postal clerk ran a small truck out, while two uniformed guards stood by, their hands on their gun butts.

"Hello. What's the gag?" Dick Thurlen asked himself.

But they had the nose of the Gordon open now and were stowing several shapeless packages into the freight compartment. They were tied with heavy cords and Dick noticed that they were slugged with stamped lead discs.

"Whew! We picked up something hot this time. Looks like real government stuff, with all those medals. Maybe we'll get off yet."

He turned and saw Miss Crowell in the cabin aisle, counting the passenger flight maps.

"What's up, Dale?" he asked.

"We must be doing it. They just flashed the 'Aboard' signal inside. Four brave souls trying it. Must want to get somewhere very quickly."

The porters were running the baggage out of the weighing room and down the runway to the freight door near the tail. Milletts was staring down at his flight plan again and wagging his head with uncertainty.

"There's one more!" bawled the man with the manifest. "He's inside plugging through a long distance call."

Two women, tired and drawn, stepped in and took their seats up near the front cockpit bulkhead. Miss Crowell checked their names off on her passenger sheet.

"Will you be requiring transportation in Newark?"

"Taxi to the Lehigh Valley station, that's all," the tall thin one replied.

Two men, heavy, carefully shaven, and bundled up in heavy ulsters, clumped up the steps and took their seats on opposite sides.

"How's the weather, baby?" the dark one asked.

"Good enough," Dale Crowell replied handing him an illustrated map. "You'll get there O. K."

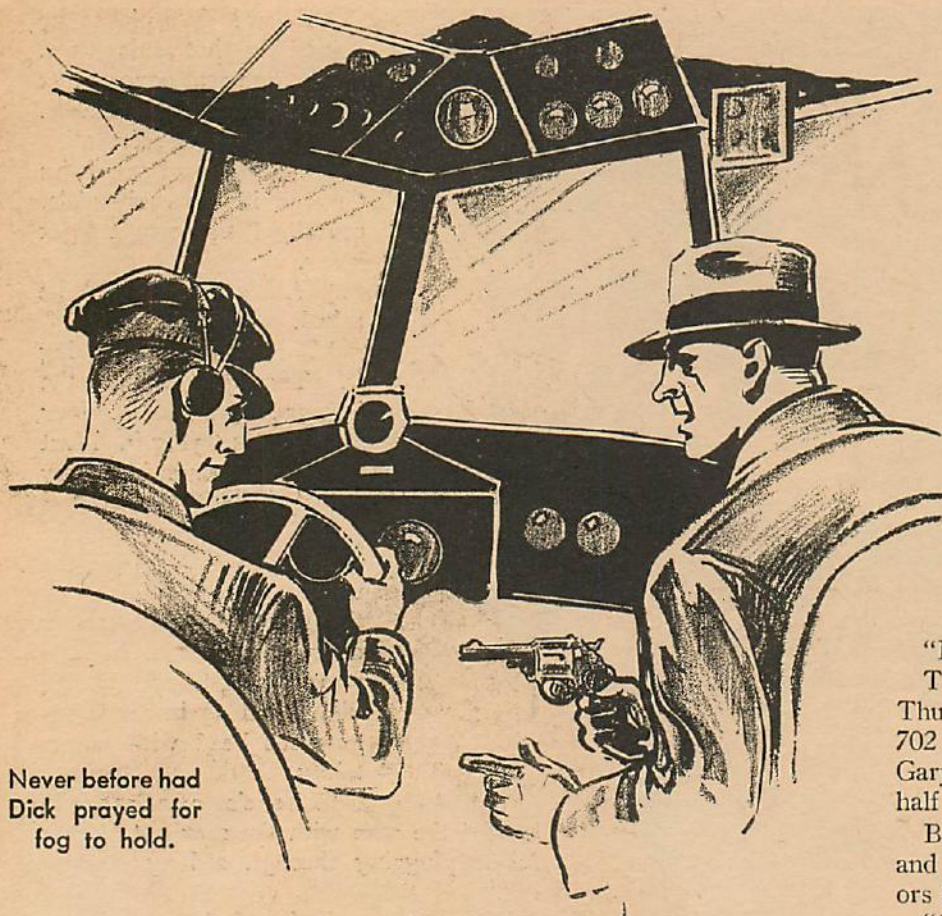
"Little fog, isn't there?"

"I wouldn't know. I'm just a hostess. You won't need a brown paper bag, will you?"

"Not the kind you hand out, kid," the dark man growled. Then he looked across at the other man, and winked. But the man across the aisle was staring hard out of the window toward the reception room.

DICK THURLEN started the motors and bawled at the lad with the wagonload of batteries. The big Tornado motors bellowed into an initial roar before the co-pilot throttled them down to idling speed and checked the fuel. He ran his fingers over a small white slide rule and then peered over the side to where Milletts was standing glaring at his flight plan.

Dick Thurlen's mind raced fast as he started to fill out his flight observation report—Form O-456-C. He scrawled in the date, the flight number and Milletts' name in the upper left-hand corner, and grinned. It meant so much to him, this flight. His required co-pilot time. He would be ready for a first-pilot rating, and a star under his gold wings. A jerk up in pay. And Dale Crowell!



Never before had
Dick prayed for
fog to hold.

Doors banged somewhere and Spring Milletts came up into the cockpit and sat down in the left-hand seat. "Pretty confident we were going, eh? I like to give the orders for starting the engines myself. You're in a rush, aren't you?"

"Sorry, Spring. I just thought—"

"Quit thinking. We're going, don't worry—but not because of you and that—well, not because I want to get you four hours, Thurlen. We got to go. See that stuff they stowed up front? Washington! Government stuff—it's got to go through—and to hell with it, I say."

There was nothing for Dick to say. He sat down again and took up the F. O. R. and continued to fill in the spaces. Milletts leaned around the door and bawled into Miss Crowell's ear: "All right. Put their belly bands on."

The girl went back down the aisle and ordered the safety belts tightened for the take-off. Milletts glanced at his terminal and clearance sheet, jabbed a few figures on it and stuffed it under a rubber band that twanged on a board at his left elbow.

"All clear?"

"All clear!"

Milletts stared out at the battery boy and got the signal that the cables were clear. He jazzed the throttles and moved away down to the east end of the No. 3 runway and turned her into the wind.

"Plane No. 702 to WEEH. O. K. to take off?" Thurlen barked into the mike.

"O. K., 702—all clear."

"All clear, hell!" snorted Milletts. "We're damn fools!"

He shoved the two throttles forward gently and the motors opened up with a dull roar. Around them faint

pin points of light marked the boundary and the tower lights. Already the slanting windows were streaked with condensation. No. 702 raced down the runway and disappeared into the fog.

MILLETTS barked at Thurlen: "Up gear, Thurlen!"

The co-pilot nodded and ratcheted away at a steel lever that drew the wheels up into the motor nacelles.

They climbed to 3,000, turned out over the lake and flew for about eight minutes. Then Thurlen snapped on the set and reported. Words came back:

"Chicago to Flight 9—go ahead."

"Pittsburgh to Flight 9—go ahead."

The two cities had contacted No. 702. Thurlen reported again: "Plane No. 702 to Pittsburgh. Two miles south of Gary at 8,000. Ceiling 400. Visibility half mile. Temperature 70."

Both Pittsburgh and Chicago replied and Thurlen wondered what the operators thought of it.

"Okey doke, Pittsburgh and Chicago,"

he replied, waiting for further orders from Milletts. The pilot said nothing, but stared ahead at his instruments. He was flying blind.

The co-pilot was about to switch off and take up his F. O. R. sheet again, when he caught a message that held his attention. For several seconds he listened, frowning.

"—Blau gas system gone haywire. Advise Norris and ask for solution. May be able to make field on northeasterly wind. Keep crew and hangar ready."

The clock ahead was ticking on and Thurlen had to fill in the sheet before him for the check point above the Goshen beam. He flipped the switch off, but continued to ponder on the strange message. Blau gas—crew—and hangar—what the devil did that mean?

They hit Cleveland and Pittsburgh dead on the nose, kiting along the beam. The ceiling was about 600 at Pittsburgh, but Milletts ran her over the beam and found the cone of silence, flew on for four minutes and brought her down to 800 feet again and glided in until he came out over the long runway and ran in. That was modern air line navigation.

"What's it like at Newark?" Milletts demanded over his mike of the control tower man, while his tanks were filled again, and a new passenger, a tall, thin, sallow man, was made comfortable.

"Thick as soup—ceiling less than 600. You might make it, Spring."

"I hope so. What runway?"

"Use No. 2 when that Amalgamated ship gets away."

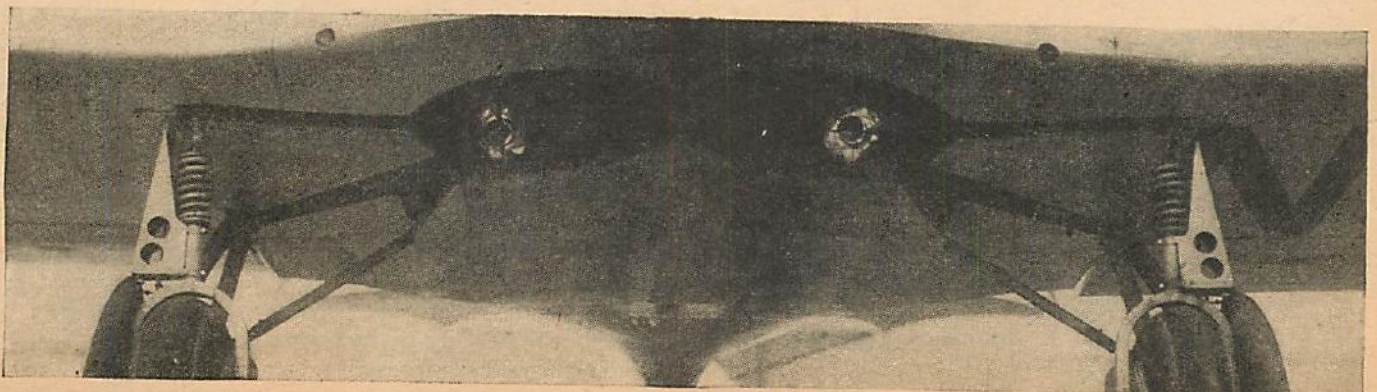
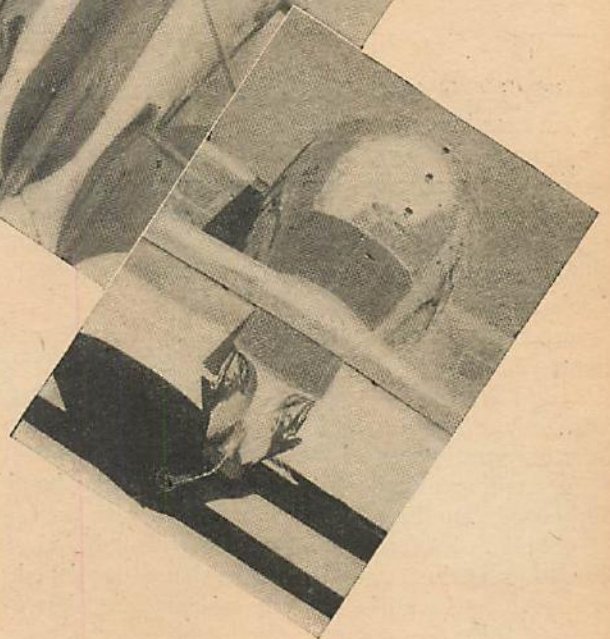
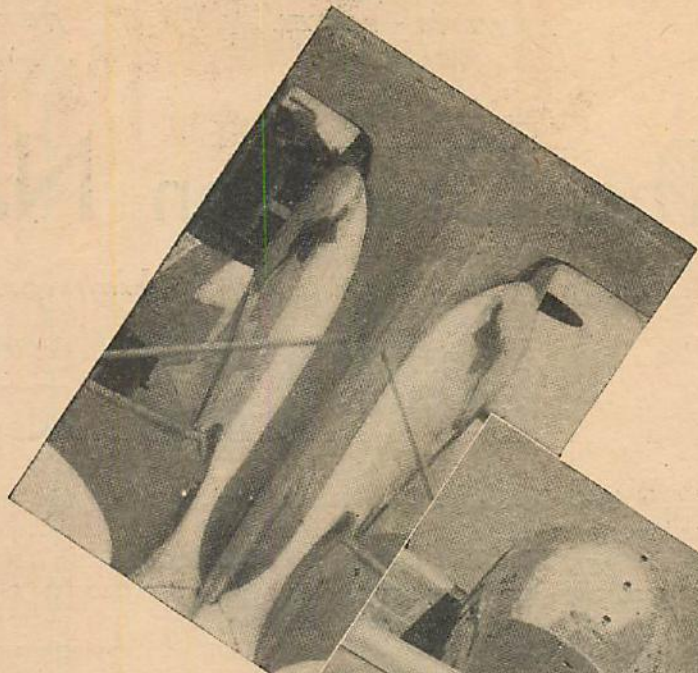
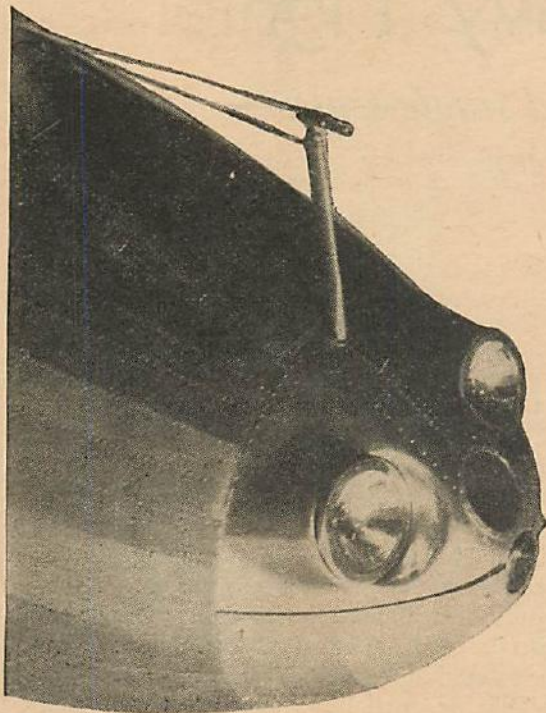
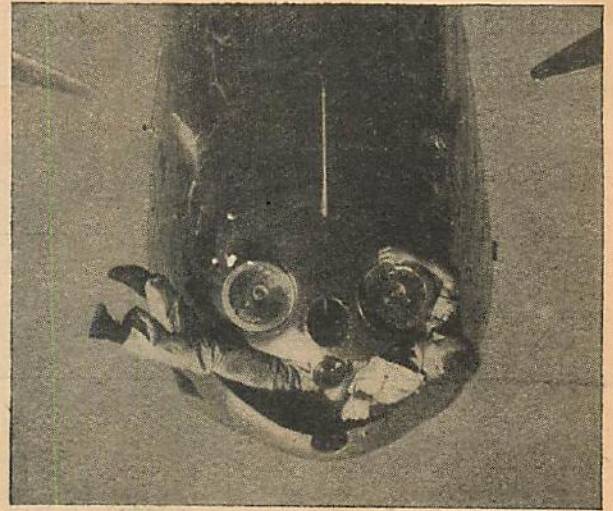
One of the passengers came up and stood in the doorway. Milletts grinned and answered one or two routine questions and turned back to the F. O. R. sheet. In a minute Thurlen returned panting and perspiring.

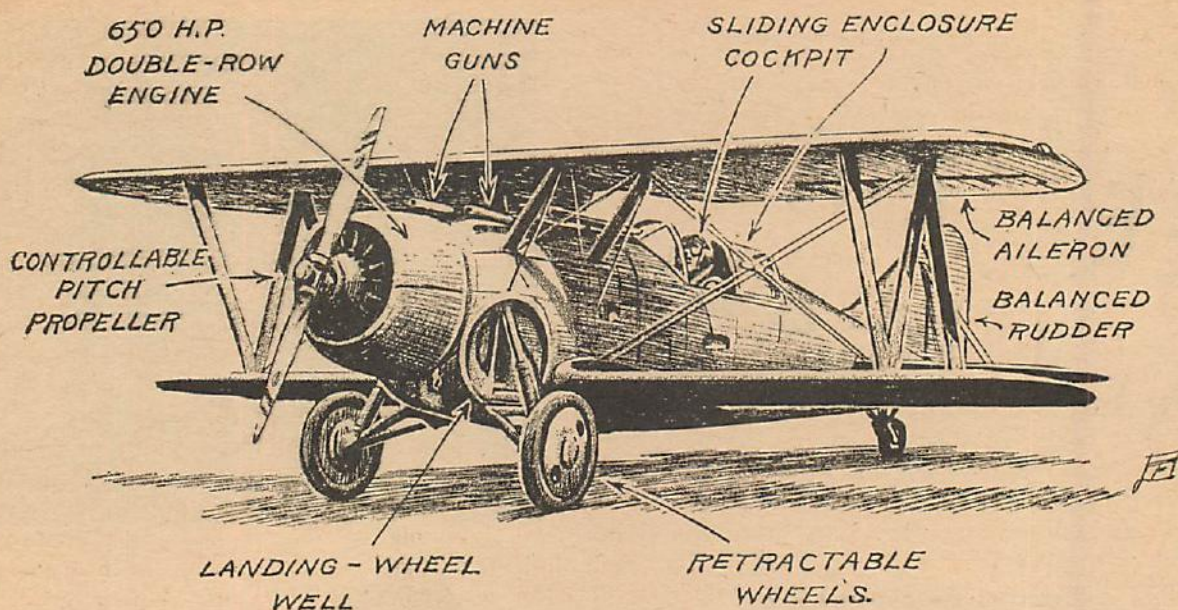
"Where were you?"

(Turn to page 68)

SEE 'EM And LEAP!

This weird zoo at the airport has a fish that sometimes eats men, a mule, a snake, and a spider! Guess their plane names—then see page 75.





The Grumman Navy Fighter

*Some details of the new high-speed single-seater—
the plane on the cover.*

by Frank Tinsley

TWO issues back, in an article on the big four-motored Boeing bomber, I told of the controversy now raging among military airmen as to whether the new high-speed, long-range bomb-droppers with their bristling batteries of machine guns have relegated the single-seater pursuit ship to a shelf in the museum of military antiquities alongside the Gatling gun and the muzzle-loading musket.

Inasmuch as a one-man fighter, to be effective against the new 265 m.p.h. Boeing, would have to be capable of a speed of at least 350 miles an hour, the case against the smaller plane would seem to be proved. And it is proved, if the only usefulness of the pursuit type lies in the job of intercepting and destroying raiding enemy bombing squadrons. The English R. A. F., faced with the highly specialized task of protecting a concentrated, industrial population against surprise raids, have developed the high-speed interceptor fighter to a degree that has overshadowed, in the popular mind, all other phases of pursuit work.

The average civilian has been crammed to the ears with half-baked magazine articles describing the terrors of gas and bombing raids by imaginary sky monsters in the war to come. He has therefore jumped to the conclusion that the next major conflict will be fought and won in the air and only in the air.

The error of this common misconception is only too evident to the trained military mind. While aircraft will undoubtedly play an enormously greater rôle than ever before, the fact remains that only a ground army, seizing and holding enemy territory at the point of the bayonet, can ever finally decide a war.

To be successful in its operations, this ground force must succeed, among other things, in wresting from the enemy forces what is termed "control of the air." Reduced to plain English, this means that hostile observation planes must be driven down and prevented from spying on our military activities, while the ships of our own observation and photographic squadrons are permitted free access to enemy secrets.

To gain and hold this tremendous advantage is the real function of the single-seater pursuit plane. To perform successfully this important mission, the pursuit squadron must take off from advanced fields, hunt down, and destroy or ground all enemy air fighting units. This task being wholly or partially completed, the pursuit pilots turn their attention to the hostile two-seaters who have been busily buzzing about the lower levels of the sky, snapping long-range cameras and correcting the fire of their artillery. Down on these humdrum soldiers of the air come the victorious fighting ships. Screaming earthward in mile-long power dives, the little pursuit planes swoop like unhooded falcons. Descending in rapacious groups upon the fleeing observation ships, they expertly box their victims in with a vicious cross fire of smoking tracer bullets and send them tumbling to the ground.

Of course, it must be understood that this operation of winning control of the air is almost never completely successful. Reinforcements are brought up by the loser and the battle is renewed. Victory flies first with one side and then the other, while the service squadrons below go about their daily business as best they may.

As you can well see from all this, a speed of 250 miles

per hour is plenty fast enough for a pursuit plane whose function is to fight hostile ships of the same type or to prey upon comparatively slow two-seaters. A little more speed, needless to say, is a distinct advantage over an adversary in single combat. So is a slight edge in maneuverability, plus a ruggedness of construction that permits you to safely perform power dives and pull-outs that would tear the wings from your opponent's crate.

In this respect, it is interesting to observe the wide differences in the ratio of speed to strength that are favored by the various air forces of the world. The English, influenced by their need for fast interceptors, emphasize speed and tend to sacrifice structural strength—so much so that it has been whispered about that the celebrated Hawker Super Fury is not overstrong.

In this country, where we are less exposed to the peril of sudden bombing raids, both the army and navy are more interested in a plane of the true pursuit type. They demand a fighting ship of such rugged construction that the specifications of the U.S. air services are recognized as the most stringent in the world. The ship must be capable of bearing stresses that the human body is unable to withstand.

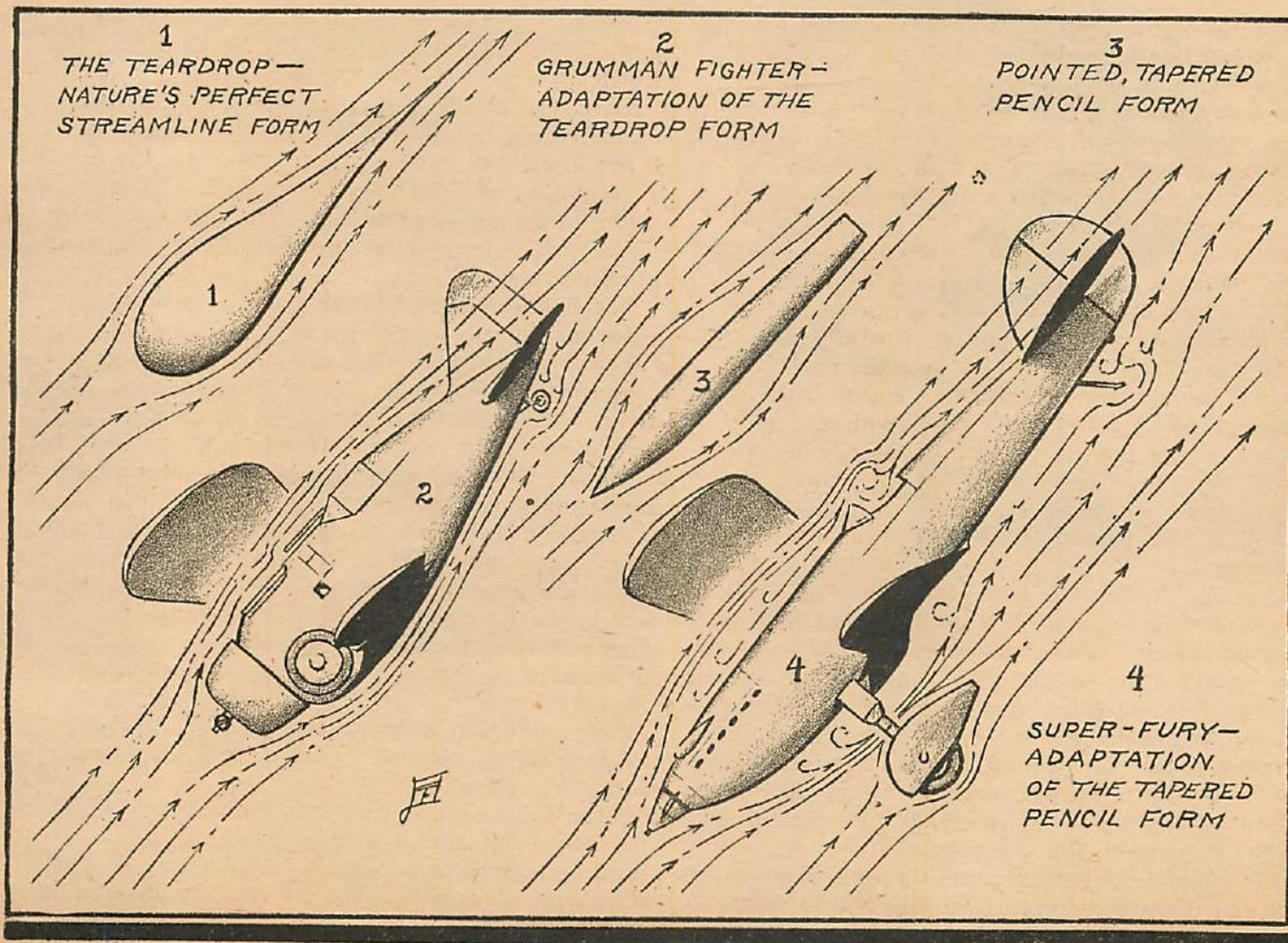
A few short months ago, an article describing the terrific effect on the pilot of test-diving new naval airplane types was published in a nationally known magazine. The author was Jimmy Collins, a test pilot widely known for his nerve and ability. The article attracted wide attention and Jimmy's friends congratulated him upon a promising literary career. Imagine the horror that gripped them when less than a week later it was learned

that Collins had hurtled into the ground at a speed of nearly 400 miles an hour in his last dive. He had contracted to test a new single-seater pursuit plane designed for the U. S. navy. On the last and most severe pull-out of the series, the plane withstood the test, but the prodigious forces exerted by gravity were too much for the courageous human being who piloted it. It is believed that Collins lost consciousness under the strain and, deprived of his guiding hand, the ship smashed in a thousand pieces.

The man was gone, but the ship had passed her tests. The type has been accepted as the newest of the navy pursuit planes. It is the plane on the cover.

This newest baby of the Grumman family of record-breaking service aircraft is similar in general appearance to the two-seater scout and fighting types that preceded it. These highly efficient ships first appeared about three years ago and were among the first to introduce the advantages of retractable landing gear to naval flying. As a result of their radical design, they enjoyed the distinction of being the fastest ships the navy possessed. I was told by one of the pilots of the famous "Ripper" squadron, which is equipped with Grummans, that in addition to their high speed, the two-place fighters are just about the most comfortable navy ships to fly in.

Shortly after the original scout and fighter were accepted by the navy as service types, the Grumman engineers pulled another ace out of the bag. This one proved to be an amphibian. It promptly folded its wheels, took off, and proceeded to demonstrate its worth. This ship has been adopted by both (Turn to page 76)



WINGS OF VENGEANCE

BY

H.S.M. KEMP



PROPELLER whistling, Fairchild C-FAB came down in a long glide over Clearwater Lake. Behind her coughing exhaust stretched the Northern wilderness, whitened by thin snow that had come before-time to warn of approaching winter; ahead, thirty miles away, lay Riverdale, jumping-off place for the new gold strike on the Churchill.

Jim Brett banked sharply into the chill wind, set his floats on the ruffled surface, and taxied in to shore. A gasoline pump, four log shacks and a log warehouse in-

icated the Clearwater base of Northern Airlines, Limited.

Here, too, sat the sister ship to Jim Brett's; canted over at an angle on the beach as a couple of men worked beneath her. Bill walked across.

"More trouble?" he asked.

One of the men crawled out. Art Nelson, as yellow-haired and blue-eyed as any of his Viking forbears, grinned ruefully.

"Trouble—and how! Bust a strut ten minutes ago—landing after a warm-up hop." Then, suddenly: "What happened to you last night?"

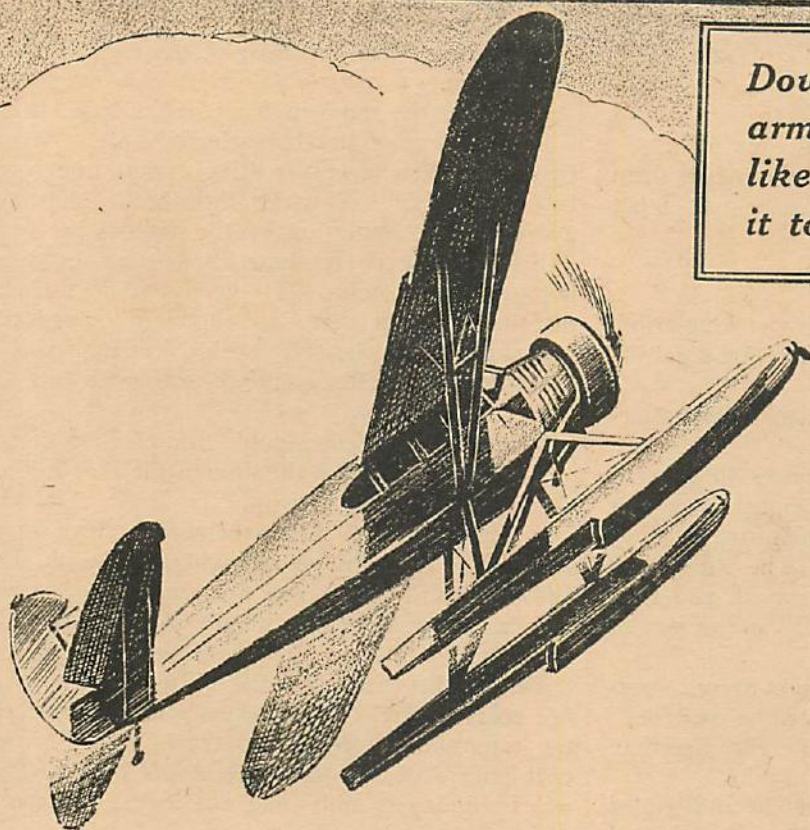
Jim lighted a cigarette. "Fog; thick as soup. Tried to get under it, but had to camp at Three Falls." He gave another look at the damaged plane; grinned provokingly. "One of these days they'll hire pilots who can land a ship without tearing her apart."

"And one of these days," came back Art Nelson, hotly, "they'll give us planes to fly, instead of a bunch of junk. Anyhow, if you haven't had breakfast yet, you'd best head for the cook shack and talk pretty to old Joe. Looks like you're heading out again—right soon."

Jim raised a gently inquiring eyebrow. "That so? Says who?"

"Says me! I'm booked for a trip to the Churchill with old Dan McGillvray and Ed Durant; but the way things are, I can't leave."

"Too bad," sympathized Jim. "Much too bad. On the other hand, after a straight month of work, I'm entitled to a couple days lay-off. And, brother, I'm taking it." With which ultimatum, Jim Brett swung on a heel and started for the cook shack.



*Down he plummeted,
arms and legs spinning
like a pinwheel. Was
it to—Journey's End?*

There it was that Art Nelson found him some moments later. Jim had shed his parka and mitts, taken a wash, and was now attacking a plate of ham and eggs. Art begged a cup of coffee from the bald-headed cook and sat at the table beside Brett.

"I've been thinking," he announced. "It's sure a crime the way you're worked—feel sorry for you and all that—but at the same time I'm sort of sorry for myself. Pay checks aren't so regular as they have been, and a two-hundred-dollar trip is nothing to be sneezed at. All of which leads up to a suggestion: How'd it be if I use your plane and take the Churchill trip? There won't be much doing for a few days—not till the mail goes North. And by that time I'll either be back, or the repairs for ARO'll be in. What say? Going to lend me FAB?"

Brett gave the matter ponderous thought. "You'll likely strip her wings or tear her floats off on the first bunch of spruce you pass over. Besides, she ought to lay off to get her skis on—we may have a freeze soon. On the other hand, if I say no you'll be as pleasant to live with as a nest of skunks. Go ahead!" he said resignedly. "Help yourself!"

"And a word to you," Art grinned. "If you should have to fly that junk of mine, take a look at the heater. Coming in the other day I froze everything but my back teeth."

"I'll tell Dupuis. Him being the mechanic around this dump," Jim pointed out. "I don't believe in keeping a dog and barking myself."

Some time later the two men went down to the ramp. Dupuis, the swarthy-faced Airlines mechanic, was working beneath the damaged C-ARO.

"You'd better quit that," suggested Jim. "Art's flying FAB. Check her over and gas her all she'll take. I'm going to town sometime this morning, so if you'll give me a list of what's broken on this job, I'll wire the factory for the parts."

Dupuis gave a sour grunt. "Do this; do that! Pity some of you haywire pilots wouldn't rustle a bit yourselves. I figure to look after one plane; not a whole flock of 'em."

"Tell Pennerton, then," advised Brett, coolly. "He's the big shot, the one who signs the checks. Or," he suddenly added; "get off the job. There are a dozen men waiting to take your place."

Dupuis shot Jim a surly glance, started to say something; thought better of it, and pushed over toward the other plane.

"Sweet, ain't he?" said Jim to Art Nelson. "Been that way ever since you got the pilot's job on ARO. Thinks you pulled a fast one on him."

But Art Nelson gave his usual expansive smile. "Trouble is he don't realize you can't keep a good man down. Good man, I said—meaning me."

"Oh, sure," agreed Jim. "That busted strut for evidence!"

Within the hour an automobile arrived at the base from town. The car was the property of Ed Durant, wealthy mining speculator of Riverdale. With Durant was a hulking, weather-beaten man in faded whipcords—Dan McGillvray, one of the best-known prospectors in the North. The third passenger was Pete Lester, Durant's bosom crony and a stock-and-bond broker in the city.

The car slithered to a stop and the three men piled out. Durant led the way to where Jim and Art Nelson were standing in the open doorway of the bunk house.

"Lo there, Brett! You flying us North?"

"Not me," Jim assured him. "Art's your man."

Durant pulled out a fistful of cigars and passed them around. "I ain't fussy who flies me, so long as I get there."

Jim lighted his smoke. "Going far?"

"There, and back again."

"Canny, eh?" Jim smiled. "Must be a staking trip."

"Just what it is. And if Art's the pilot, Art'll get his orders once we're in the air."

Pete Lester, fat and jovial in a thousand-dollar otter-skin coat, gave a wheezy laugh.

"You guys are good! Old Dan figures he's found something better than pig iron, and right away you blow in two or three hundred bucks to prove whether it is or not. Me, now, I'm different. The stuff I got lined up ain't no gamble. It's been assayed, and runs high. Maybe," he suggested to Jim, "I can get you to fly me on a staking trip?"

"You can," allowed Jim. "But not right away. Anyhow, why not go with Durant and share the expense?"

Pete Lester shook his head. "Different direction. Then again, I'm not just ready."

Durant and McGillvray turned to the car and hauled out pack sacks and a grub box. Jim lent a hand; and while so engaged, Durant gave Jim a hint of what was back of the trip.

"Dan ain't after pig iron. He blundered onto some pretty fair-looking stuff north of the Churchill. He was too low on grub to stop and stake right then; so he hit for town and told me about it. If the stuff's any good, Dan and I go in together on the thing. I pay all expenses, including organizing a company, and Dan gets half the grift."

"Fair enough," agreed Jim. "What say, Dan?"

Dan McGillvray's weather-beaten face broke into a slow smile.

"I ain't lookin' for no fortune. Five thousand'll be enough. Just so's I can send Larry over to London. Y'know."

"I know," said Jim with an answering smile. "And here's hoping." His mind flashed to Riverdale and young Larry McGillvray—Larry with his twisted body and his cheery smile; Larry, waiting for the day when his dad should make the "strike" that would enable him to take the long trip from Riverdale to the world-famous specialist in Harley Street. "Yeah, Dan." Jim nodded again. "Here's hoping."

The dunnage was piled into the Fairchild's cabin. Art Nelson, Ed Durant and Dan McGillvray took their chairs. Jim, who was nearest the door, heard Art ask a question of Durant.

"Sure you know where we're going?"

"Sure," was Durant's reply. "We got a map, ain't we, Dan?"

But Dan McGillvray seemed more concerned with his present trip than its destination.

"I feel like I was out in the middle of a lake with a broken-backed canoe. Go easy now, Art. No figure eights in the air to scare an old bush rat like me!"

Art Nelson gave a laugh, gave a meaning wink to Brett in the open doorway.

"Don't fret, old-timer. If I take you up, you'll sure come down."

A moment later, the blast of the engine cut off further speech.

Down on the ramp in front of the base, Brett stood with Pete Lester watching the take-off. Art and his passengers were away—roaring toward the Narrows—rising in the air. Now Art brought the ship around in a wide bank, coming toward the base again.

Between Clearwater and Caribou Lakes was a dry hop of twenty miles. To give himself the necessary margin of safety, Art was climbing for altitude. He passed the base; headed south. Then he was coming back, roaring north behind the camp at two thousand feet.

"Great life you fellers got," grunted Pete Lester.

But as Jim watched, the nose of the Fairchild dropped sharply. The tail came up. To Brett, Art was going into a power dive. He remembered Art's laugh; and his wink. It might be all right to give old Dan McGillvray a thrill—Art was a crazy cuckoo, anyway, but with a heavy ship, Art wasn't allowing himself much room.

Behind the base, over the hills, the ship maintained her roaring dive. Jim, suddenly uneasy, ran out onto the ramp's end. He stood there, gazing skyward as cold fingers of fear clutched at his heart. The plane was beginning to spin—she was logy. Art could never pull her out of it now—

Numbed, Jim stood and watched. Lester swore beneath his breath.

Motor droning, white plumes of exhaust streaking behind her, the Fairchild disappeared behind the hills. Came a moment of waiting, tense, awful—then a rending, tearing crash shook the earth.

The silence that followed was petrifying, full of dread. Then Jim snapped out of it, and rushed to the shore.

He passed the cabins, began a mad scramble up the timbered hills. Branches ripped at his face but he failed to give them notice. He was looking ahead, expecting to see, yet dreading, a black cloud of smoke that would turn the wreck into a funeral pyre.

But none came. A half mile away Jim caught a glimpse of a bit of crimson fabric in the top of a giant spruce. Beneath the spruce, settled in a bed of broken birches, was C-FAB.

Her wings were crumpled, her propeller and motor buried. The tail was up, elevators and rudder canted crazily. Jim swarmed over the wreckage and yanked at the twisted and binding door.

All three men were dead, their broken bodies jammed between chairs and instrument board. There was little for recognition about Art Nelson. His face had taken the full impact of the crash. Jim carried him out and laid him on one of the tattered wings as Pete Lester and the bald-headed cook arrived. Jim trembled with emotion.

It seemed unreal that this smashed body could be that of Art Nelson—Art, who less than fifteen minutes before had been grinning and vital. The Art Nelson who had winked at Jim as he sat joshing old Dan McGillvray.

Jim Brett swallowed a lump in his throat.

"Crazy stuff. You did it once too often, Art, old man—"

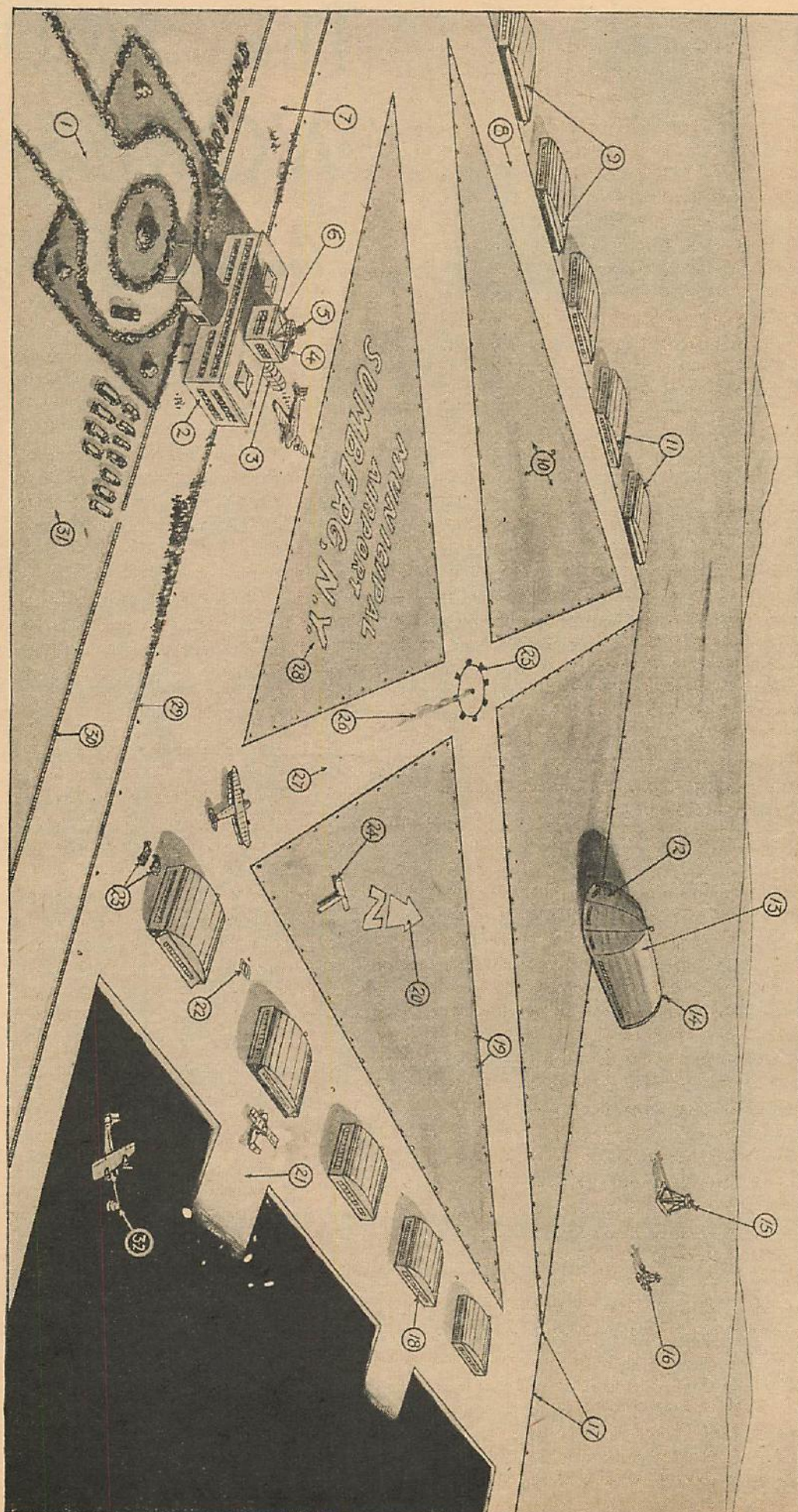
It was all a horrible nightmare. As he worked at extricating McGillvray and Ed Durant, (Turn to page 71)

THE FLIER'S DICTIONARY

The sixth lesson in the technical terminology of the air. Save your files!

THE AIRPORT

- 1 ENTRANCE
- 2 ADMINISTRATION BUILDING
- 3 PASSAGEWAY TO PLANES
- 4 BATTERY OF FLOOD-LIGHTS
- 5 REVOLVING BEACON
- 6 TRAFFIC CONTROL TOWER
- 7 SPECTATORS AREA
- 8 APRON
- 9 HANGAR LIGHTS
- 10 EMERGENCY LANDING AREA
- 11 PRIVATE HANGARS
- 12 ORANGE PEEL DOORS
- 13 DIRIGIBLE HANGAR OR DOCK
- 14 OBSTRUCTION MARKING LIGHT
- 15 STATIONARY MOORING MAST
- 16 MOVABLE MOORING MAST
- 17 BOUNDARY LIGHTS
- 18 SEAPLANE HANGARS
- 19 SUNKEN RUNWAY LIGHTS
- 20 DIRECTION MARKER
- 21 SEAPLANE RAMP
- 22 SUNKEN GASOLINE PUMP
- 23 EMERGENCY AMBULANCE AND FIRE TRUCKS
- 24 WIND TEE SHOWING WIND DIRECTION
- 25 FIELD MARKER (MUNICIPAL)
- 26 SMOKE WIND INDICATOR
- 27 CEMENT RUNWAY
- 28 FIELD IDENTIFICATION
- 29 MESH AND CANVAS FENCE
- 30 PARKING FENCE
- 31 PARKING AREA
- 32 SEAPLANE MOORING BUOY





The MODEL WORKSHOP

Conducted by Gordon S. Light

A CAMEL ambling across a desert is said to be able to "smell" water many miles away. This instinct will lead him straight to an oasis, though it may be the only such spot in hundreds of square miles of sand. But that instinct alone would not make the camel an ideal desert animal. Accompanying his water-sniffing knack is the camel's ability to endure the long trips between water holes. Locating water holes wouldn't do the camel much good if he wasn't able to get to them.

And so it is with model airplanes. The Thermal Finder is the camel of model building. Its specialty, however, is thermal currents, not water holes. A thermal current means the same thing to a model builder that a water hole does to a desert traveler, since a thermal current is a rising current which will take your model skyward. And, camel-like, the Thermal Finder seems

The average flight is 2 minutes in still air when there are no thermals, as in the late evening or early morning. The warm rising air of midday will often double or triple the length of flights. Proof of this is the number of four- and five-minute flights logged by my ship.

But we are procrastinating—a big word that means we should be working instead of talking. So open the shop door and we'll go inside, armed with a copy of AIR TRAILS and a determination to do some modeling.

FUSELAGE CONSTRUCTION

Material: 1/16" sheet balsa for formers, 4 pcs. 1/8x1/8x36" and 8 pcs. 1/16x1/8x36" for fuselage longerons, 6" length of bamboo for nosing (former "A").

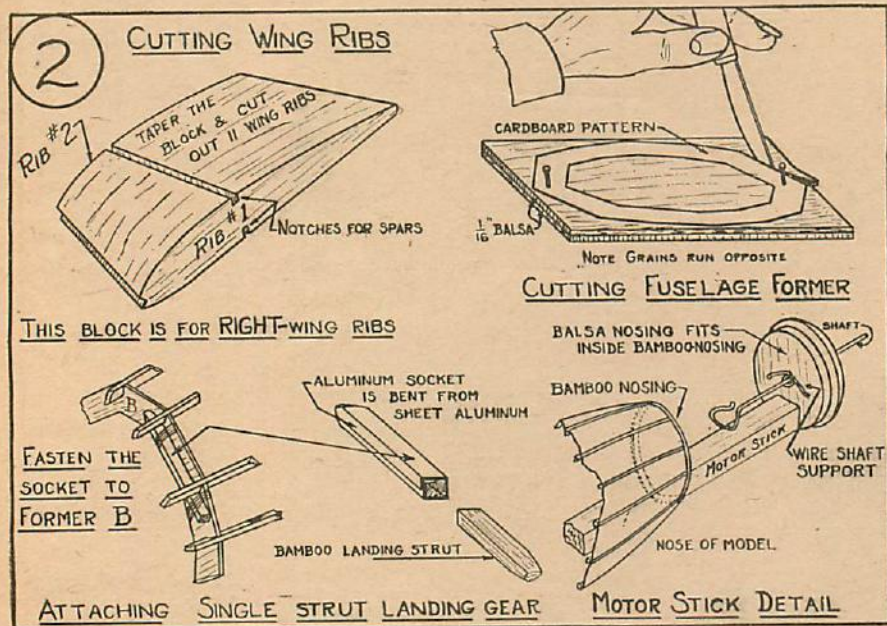
The 12-sided fuselage formers are cut from laminated sheet balsa, built up from two thicknesses of 1/16" sheet balsa. The exact shapes of these formers are given in drawing #1. The best technique in this type of fuselage construction is to make cardboard patterns of the formers and use these in cutting out the balsa (see drawing #2). The fuselage is shown in one-third scale in drawing #3. This will show the position of the formers, which have been labeled A, B, C, etc. Notice that the space between the formers varies and it is essential you follow these dimensions to preserve the true shape of the fuselage.

Twelve balsa strips run lengthwise along the fuselage, connecting the formers and giving the fuselage its strength. These pieces, called longerons, fit edgewise into the formers. In this position the wood offers more resistance to the shrinking of the doped tissue covering.

The formers have been cut with flat sides to facilitate covering and reduce the wrinkles that naturally follow an attempt to cover curved surfaces with tissue.

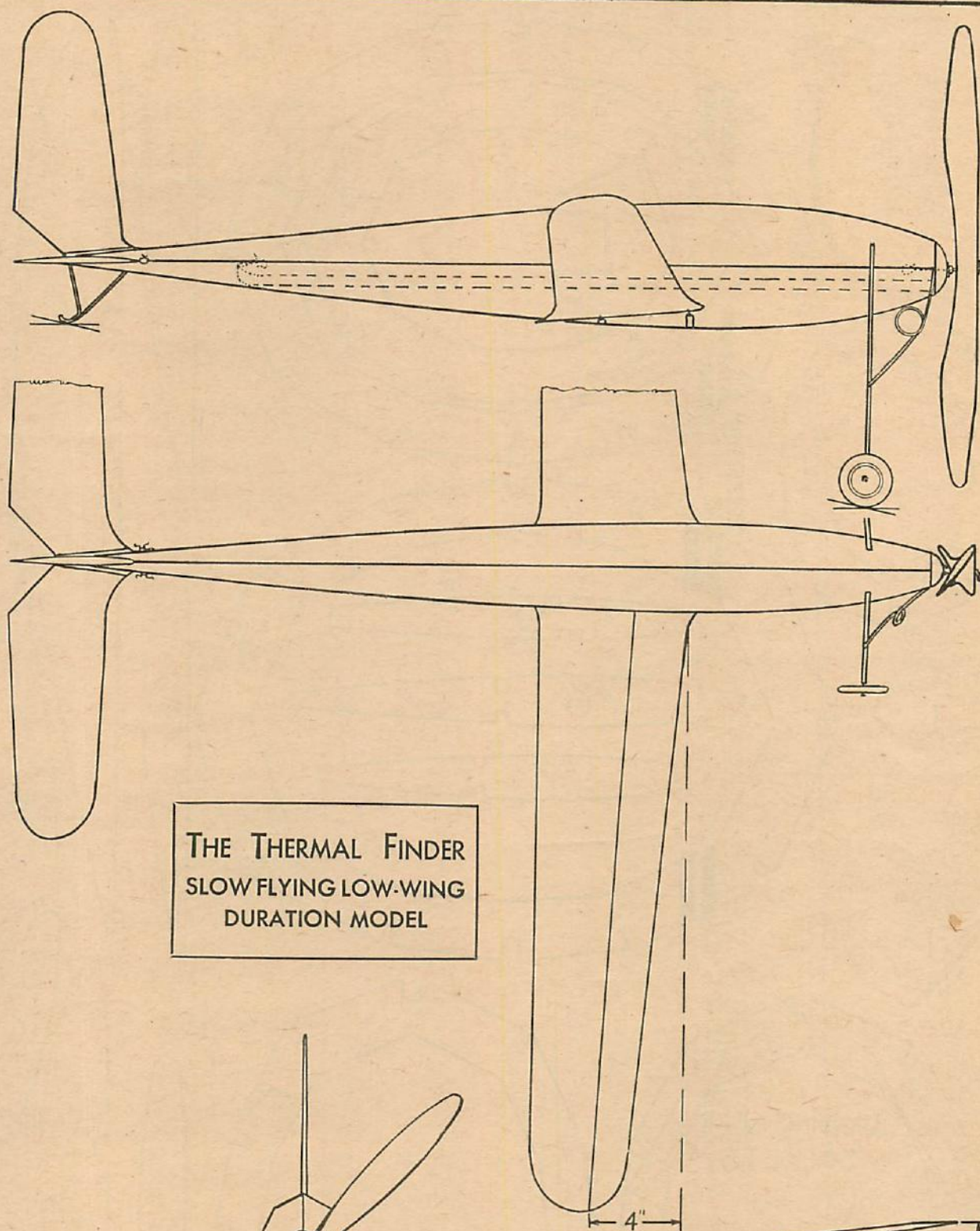
The four main longerons are 1/8x1/8" and are inserted on the top, bottom, and sides of the formers. In building the fuselage begin with these longerons, then add the remaining 8 stringers which are 1/16x1/8x36".

Former A, the front nosing of the fuselage, is bent from bamboo, cemented and thread-tied to the front ends of the longerons. The rear ends of the longerons are cemented together and rounded with sandpaper. A

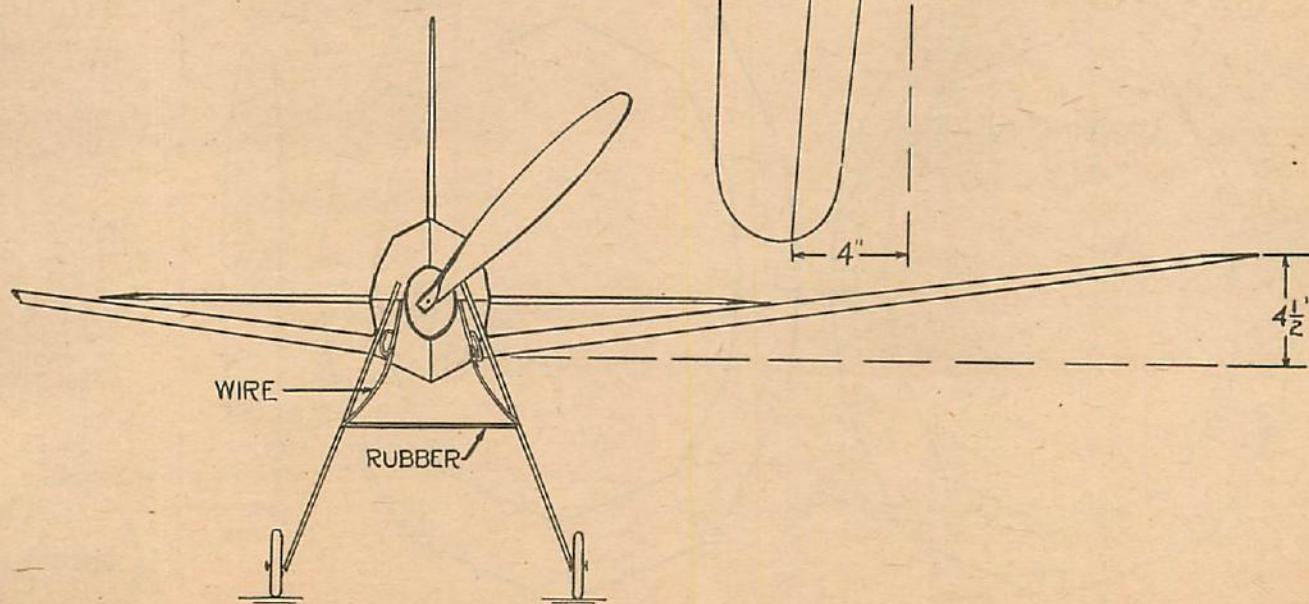


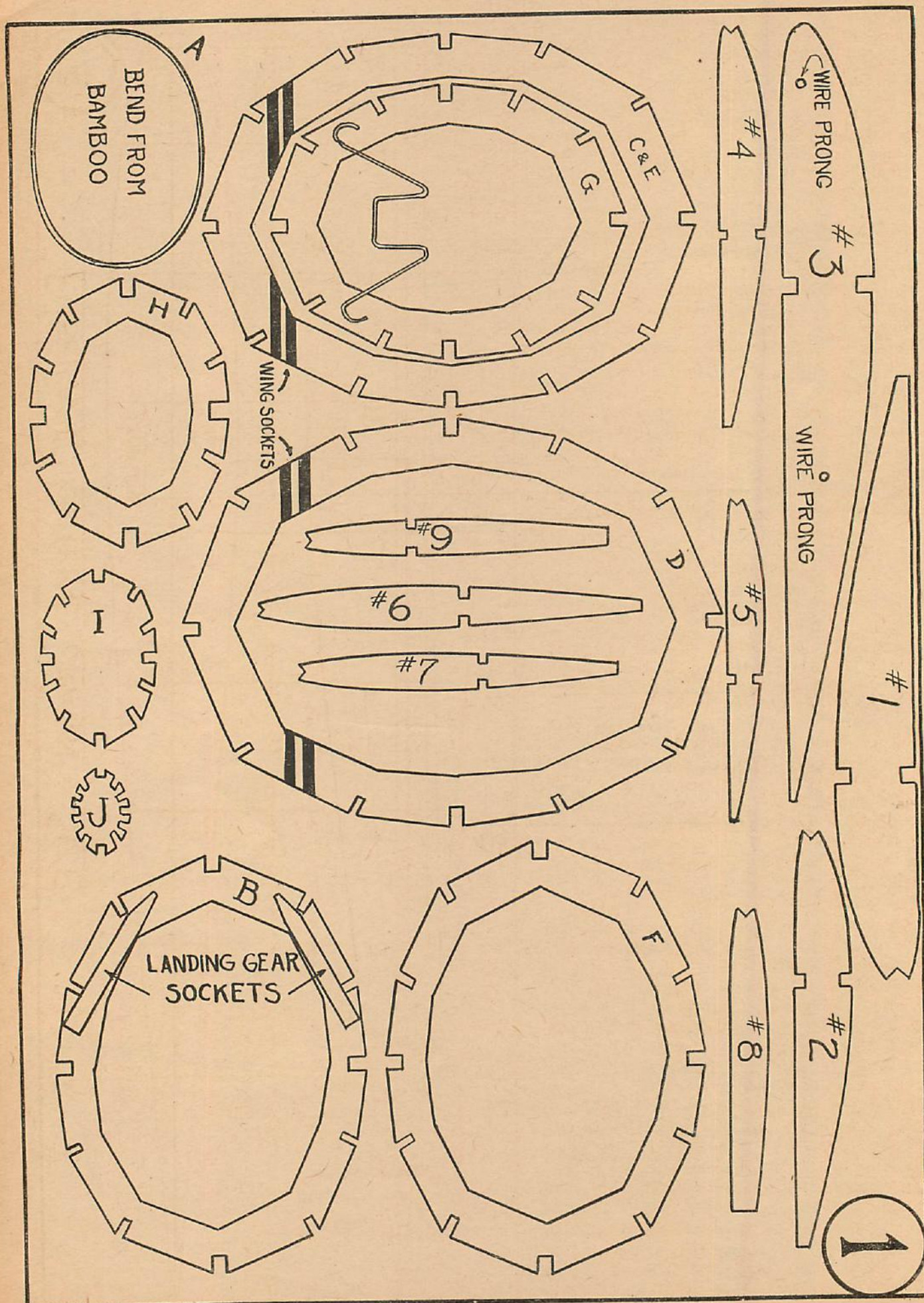
to "smell" thermals while they're far away. Furthermore, it has the power to climb up to them. Thermal-finding ability and long-range duration are ideal qualities, and the Thermal Finder is an ideal model because it embodies both of them.

The Thermal Finder is a low-wing model with an oval, streamlined fuselage. Both wing and tail are tapered, making a trim-looking ship. It will sell itself to those who must travel through a crowded city to the model field, inasmuch as the wing, tail, and landing gear are demountable for small-box packing.



THE THERMAL FINDER
SLOW FLYING LOW-WING
DURATION MODEL





notch $3/32 \times 3/32$ " is filed in the rear tip of the fuselage to accommodate the elevator.

LANDING GEAR

Material: 2 bamboo struts $1/16 \times 3/16 \times 9 1/2$ ", several square inches of sheet aluminum, $1/4 \times 1 3/4 \times 3 1/2$ " balsa for wheels, a foot of wire for axles and landing gear shock absorbers.

Landing gear bamboo struts are oval-shaped except at the upper ends, which are left oblong. These ends fit into aluminum sockets. By wrapping the sheet aluminum around the end, you can obtain a snug fit. The landing gear is attached to former B as in drawing #2, the exact position of the sockets being shown on the former in drawing #1.

Two pieces of wire reinforce the landing gear. They extend from former A to the center of each strut. The large plan-view drawing illustrates the method of bracing the landing gear. A piece of rubber $1/30 \times 1/8$ " joins the center points of the struts. The rubber should be taut when the wheels are 8" apart. The wheels, cut from $1/4$ " sheet balsa, are $1 3/4$ " in diameter.

MOTOR STICK

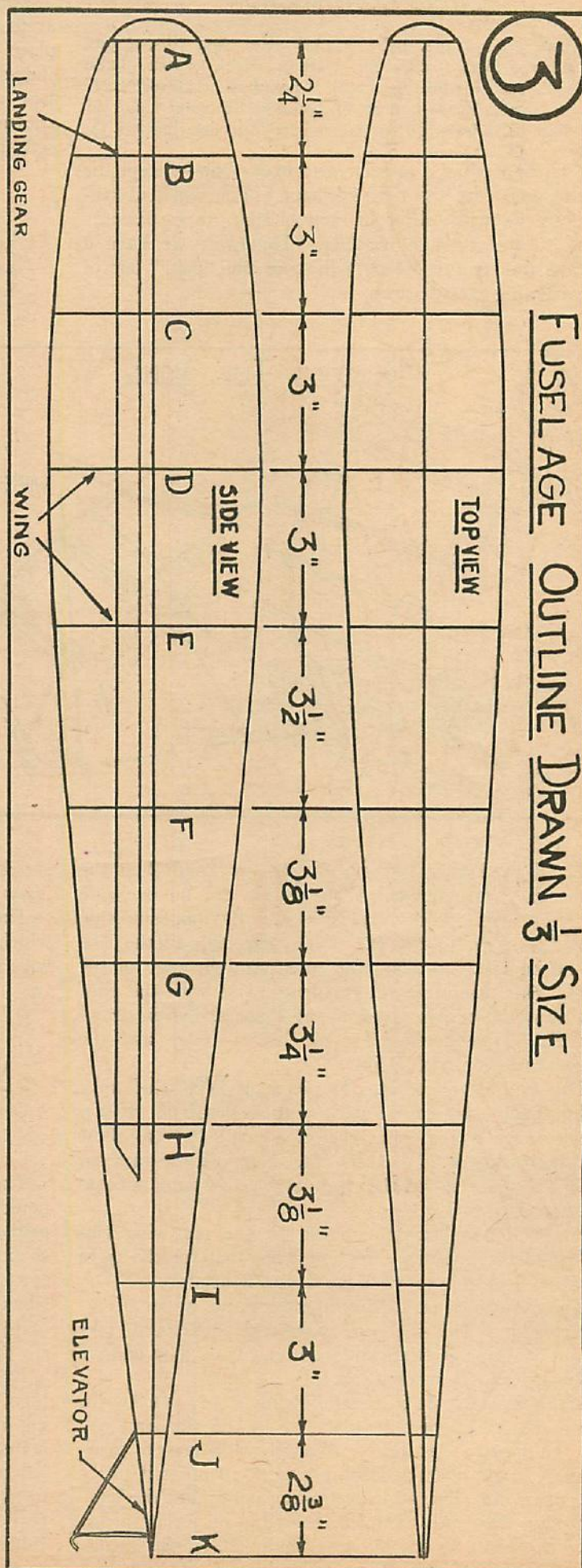
Material: 1 U-beam $3/8 \times 3/8 \times 24$ " with $1/16$ " cap strip or a solid balsa stick $3/8 \times 3/8 \times 24$ ", 1 block of balsa for nosing $1 3/4 \times 1 1/2 \times 2$ ", small piece of wire for rear hook, clip support, etc.; 1 punched clothing snap or a cup washer for propeller bearing.

The 16-strand rubber motor has plenty of pep when fully wound, so you will need either a built-up motor stick or a solid one cut from hard, straight-grained balsa. A U-beam of $3/8 \times 3/8$ " outside dimensions with $1/16$ " walls and cap strip will take care of 16 strands. A solid stick will take the strain, but will add a trifle more weight.

The motor stick is removable for winding and changing the rubber motor. Mount a balsa nose block at the front of the stick (drawing #2). This nose block is the shape of former A. The inside edge is cut away so that the nose block fits into former A like a plug. It should fit snugly, since it holds the front of the motor stick in position. Attach the nosing to the front of the stick by cutting a notch in the bottom of the nosing and cementing.

The rear of the motor stick rests in the clip at former G shown in drawing #1. A wire spur cemented and threaded to the bottom of the motor stick slips under this clip and prevents the propeller thrust from pulling the stick out of the fuselage.

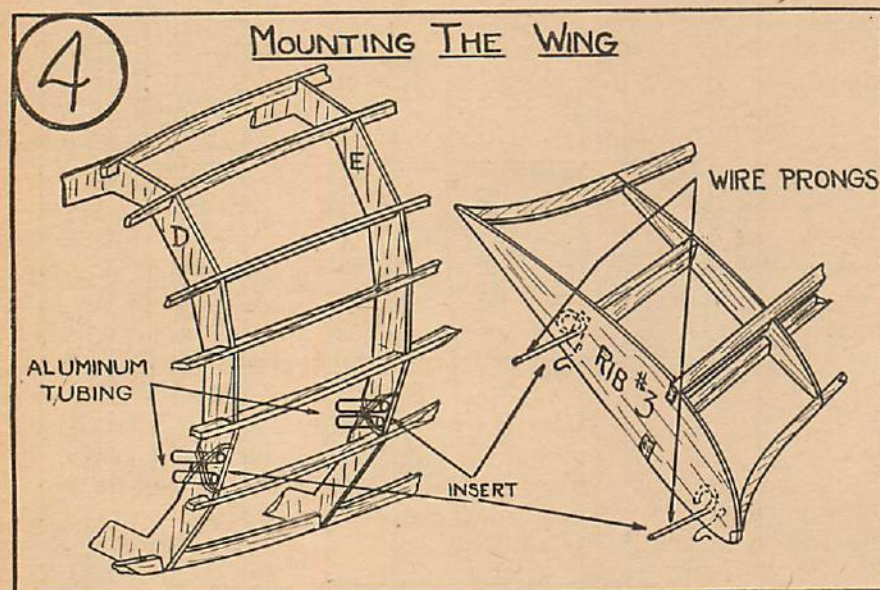
A punched clothing snap or a cup washer (for sale at most model supply houses) is cemented to the balsa nosing about $1/2$ " above the top of the stick. This serves as a bearing for the propeller.



WING CONSTRUCTION

Material: 2 pcs. balsa $\frac{3}{4} \times 5 \times 1$ " for wing ribs, 2 pcs. balsa $\frac{3}{32} \times 5 \times 16 \times 20$ " for trailing edges, 2 pcs. balsa $\frac{1}{8} \times \frac{1}{8} \times 20$ " for leading edges, 2 pcs. balsa $\frac{3}{32} \times 3 \times 32 \times 24$ " for spars, 1 small piece of bamboo for wing tips, $\frac{1}{8}$ " sheet balsa for end ribs (labeled No. 3 in drawing No. 1).

A tapered wing is attractive to every one—except the person who cuts the ribs to shape. The work of cutting out the many different sizes of ribs proves discouraging to the average modeler. However, we have a method this month which will take the "pain" out of tapered-wing construction.



You'll need only two rib shapes—#1 and 2 in the drawing. Trace out the shape of rib #1 on one side of a soft balsa block $\frac{3}{4} \times 1 \times 5$ ". On the opposite side trace the shape of rib #2. The rear ends of the ribs should be lined up along the same straight edge of the block. The grain should run lengthwise with the ribs. Cut away the excess wood, to the shape shown in drawing #2. The notches for the leading edge and the spars are put in with a file.

This block is sliced into 11 pieces of $\frac{1}{16}$ " thickness. A knife and ruler can be used in this operation. If you prefer to use a saw, remember that you'll have to allow for the thickness of the saw cut. Suppose the saw cut is $\frac{1}{16}$ "; the size of the original block would have to be increased to $1\frac{5}{8}$ ".

Another reminder—the block for the left wing ribs tapers in the opposite direction from that for the right wing. Check this to avoid needless duplication.

The end rib of each wing is cut separately out of $\frac{1}{8}$ " sheet balsa. This increase in rib thickness is to take up the additional strain upon the end rib. The end rib is labeled #3 in drawing #1.

Wing assembly is in the following steps: cement the top and bottom spars in place in all the ribs and rest the wing on a flat board covered with waxed paper while it dries; add the leading edge, cementing it to the notches in the ribs; add the trailing edge; add the bamboo wing tips. Always place the wing on a flat surface after a cementing operation. Pin it flat on the surface to insure a warp-free wing. Check with drawing #5.

The end rib—#3—is cemented at such an angle as to fit against the fuselage. By holding the wing in place (between formers D and E) you'll be able to judge whether the end rib will lie flat against the fuselage. Remember the wing is given dihedral angle, as shown in the plan-view drawing, so allow for this in setting the angle of the end rib.

WING ATTACHMENT

Material: Several inches of $\frac{1}{16}$ " diameter aluminum tubing, $\frac{1}{2}$ foot of heavy piano wire to fit inside the tubing.

Drawing #4 shows the details of wing attachment. Four small sections of tubing are cemented and threaded to formers D and E. The reason four pieces of tubing are used is to enable you to make changes in wing setting without tearing down the fuselage. The positions for the wing sockets are the striped sections of formers D and E.

Two wire prongs fastened to the end of the wing fit into the sections of aluminum tubing, holding the wing in position. The exact shape and position of these wires is shown in the pattern for rib #3 in drawing #1. These wires should be bent at such an angle that the tip of each wing is raised about $4\frac{1}{2}$ ". In addition to being raised, the wings have been designed "swept back"—that is, from above the wing looks like a thin letter "V." The tip end of each spar

should be 4" back of former D. The wings are also given "washout," of which more later.

The wings are secured in position by a rubber band which passes underneath the fuselage and attaches to wire hooks cemented to each end rib.

ELEVATOR AND RUDDER

Material: 3 pcs. balsa $\frac{1}{2} \times \frac{1}{2} \times 3\frac{1}{2}$ " for elevator and rudder ribs, 1 pc. balsa $\frac{3}{32} \times 3 \times 32 \times 24$ " for leading edge of elevator and rudder, $\frac{3}{32} \times 3 \times 16 \times 24$ " for trailing edge, 4 pcs. bamboo $\frac{1}{16} \times 1 \times 16 \times 10$ " for spars.

The exact shape of the rudder and elevator is shown in drawing #5. The ribs can be cut using the same method described for wing construction. Elevator rib shapes #4 and 5 are traced out on opposite edges of the $\frac{1}{2} \times \frac{1}{2} \times 3\frac{1}{2}$ " block. Shape this block and slice off the ribs to $\frac{1}{16}$ " thickness. The two center ribs are cut out of $\frac{1}{8}$ " balsa. In cutting the rudder ribs use #6 and 7 rib patterns.

Rudder and elevator construction follows closely the type used in the wing. Pin the framework to the drawing during building to insure accuracy. The elevator is made in two pieces and then joined. Notice the space left between the two halves. It should be large enough to fit the fuselage. The spars fit into a notch filed in the rear of the fuselage. The elevator is held in place by rubber bands attached to the hooks on the elevator and to those cemented on the fuselage (Turn to page 77)

What's Your Question?

By **CLYDE PANGBORN**
Wing Commander



As soon as possible after the questions are received, the Wing Commander of the Air Adventurers will answer on this page such questions as appear to be of general interest to our members.

Question: How may I become an army air corps pilot without taking at least the two-year college education? H. J. S., Lowell, Massachusetts.

Answer: As an applicant without college education for appointment as flying cadet, which leads to air-corps service, you will have to pass examinations in these subjects: U. S. history, general history, English grammar and composition, geography, arithmetic, higher algebra, plane and solid geometry, plane and spherical trigonometry, and elementary physics.

You'll find that the chance of getting in this way is slim. Cadets are chosen from the top of a long waiting list of qualified candidates arranged in twelve groups, and civilians without any college education form the last group on the list. There is a chance of appointment, of course, but it is not guaranteed. For further information on the educational examinations, I would suggest that you write to the Chief of the Air Corps, War Dept., Washington, D. C., for the booklet "Flying Cadets."

Question: What number of flying hours are required for a transport license in the United States? G. F., Halifax, Nova Scotia.

Answer: A transport license demands 200 hours of solo flying, at least five of them within the sixty days preceding application. Graduates of approved flying schools need only 175 hours if they apply within ten days of graduation. The transport license entitles you to fly persons for hire in conventional aircraft.

Piloting a transport plane in regular interstate passenger operation, however, is something else again. That requires a further form of the transport license, called a "scheduled air transport" rating. For that the minimum is 1,200 hours certified solo time within the last eight years, of which at least 500 must have been cross-country, and 75 hours of solo night flying, at least half of it cross-country over lighted airways. Part of co-pilot flying time may be credited, within certain rules, toward the above rating.

Question: How do navy planes, catapulted from battleships which have no landing decks, get back on the ships again after flight? L. T. O., Memphis, Tennessee.

Answer: Being seaplanes, they land nearby on the water and taxi to the side. From there they are hoisted aboard.

Question: Does a plane fly faster at high altitude with a small angle of attack on the variable-pitch propeller blades, or vice versa? R. B., Fall River, Massachusetts.

Answer: The thinness of the air at high altitudes reduces the effectiveness of the normal propeller setting. Therefore the blades are turned farther outward to take a bigger bite and maintain the propeller's efficiency. The gain in speed is due largely to the lessened resistance offered to the airplane by the thin air. It is in taking off from the ground that the blades are altered to a small angle, so that the engine can turn over the propeller at full power and number of revolutions against the thicker sea-level air.

Question: Please give the addresses of the firms who manufacture the light motors mentioned in the "Pou du Ciel" or Sky Flea article. A. M., Streator, Illinois.

Answer: Here are the engines mentioned in Frank Tinsley's article, and the companies who make them. Aëronca 36 h. p. twin-cylinder: Aëronautical Corp. of America, Lunken Airport, Cincinnati, Ohio. Continental A-40 37 h. p.: Continental Aircraft Engine Co., Muskegon, Michigan. Aëromarine AR-3-40 40 h. p.: Aëromarine Plane & Motor Co., Keyport, New Jersey. Szekely SR-3-35 35 h. p.: Aviation Holding Co., Holland, Michigan.

Along with the Heath B-4, a light 4-cylinder-in-line 25 h. p. engine made by the Heath Aircraft Corp. of Niles, Michigan, which might be difficult to fit to the Flea's present design, these engines represent the range of light power plants in this country. None of them is cheap, as yet. Perhaps if Fleas win popularity, the engine prices will come down.

Question: What is wing loading and how is it determined? A. F., Fresno, California.

Answer: Wing loading is a comparative measurement used to indicate the relation between a wing and the weight it supports. It is found by dividing the area of the supporting surface by the gross weight of the plane, fully loaded. The supporting area should include the ailerons, but not the stabilizer or elevators. The resulting figure is usually expressed as pounds per square foot.

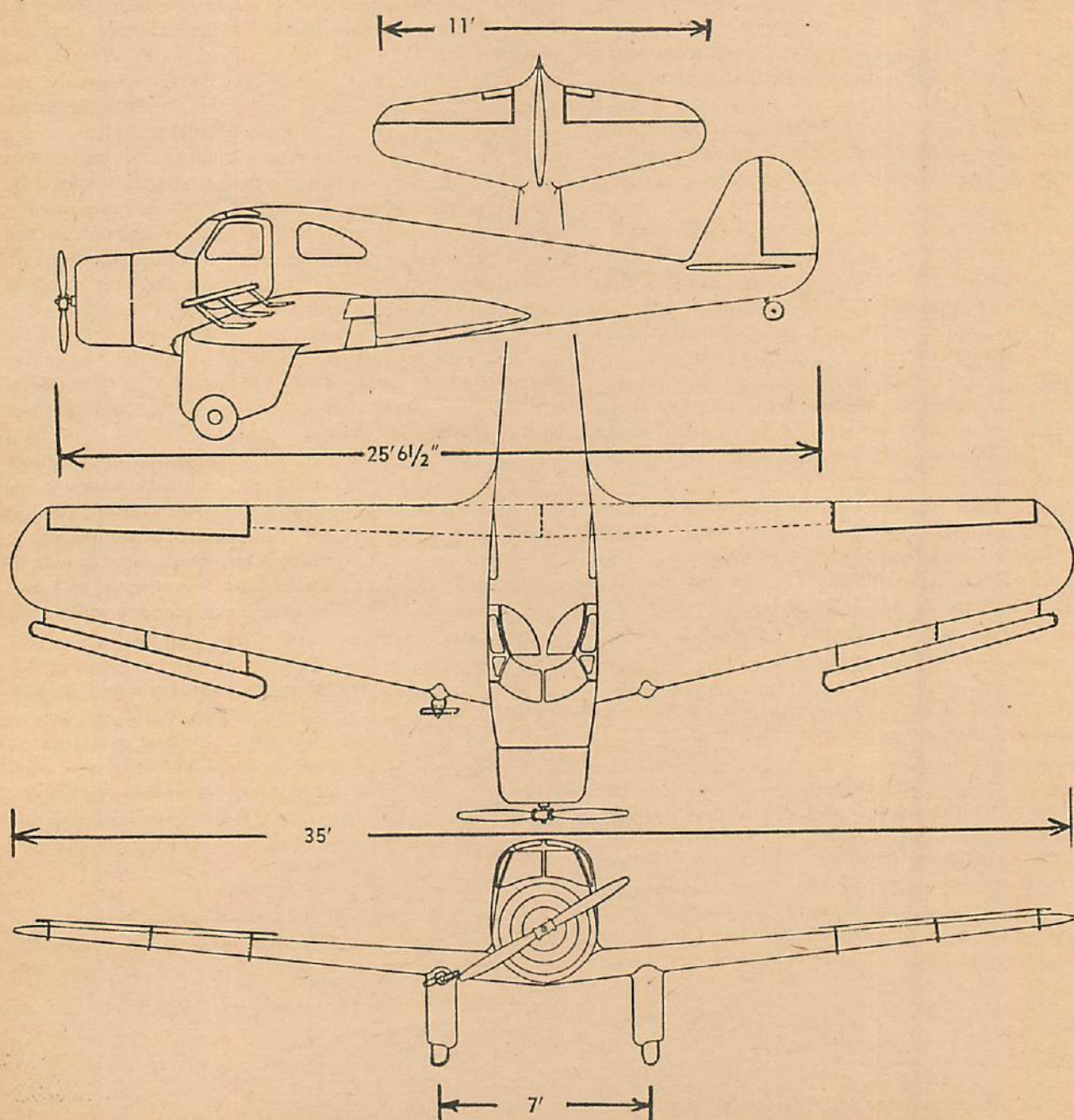
Transport, Jr.

Curtiss-Wright presents an air liner scaled down for easy amateur flying.

by Albert J. Carlson

WHEN Eugene Vidal, director of the government's bureau of air commerce, called on designers a year and a half ago for new types of aircraft that would be cheap for the average man to own and simple to fly, he probably wasn't thinking of transport planes.

A transport is big, heavy, expensive, complicated—the last thing in the world that the average man would de-



These plan views are drawn three-sixteenths of an inch to a foot.

sire as his own private air bus.

But one manufacturing company looked beyond the facts of size and power that come to mind when one thinks of transports. They saw in modern transport planes certain qualities of rugged metal construction, stability, speed, and comfort that enable the big ships to fly millions of miles each month on the nation's airways safely and efficiently.

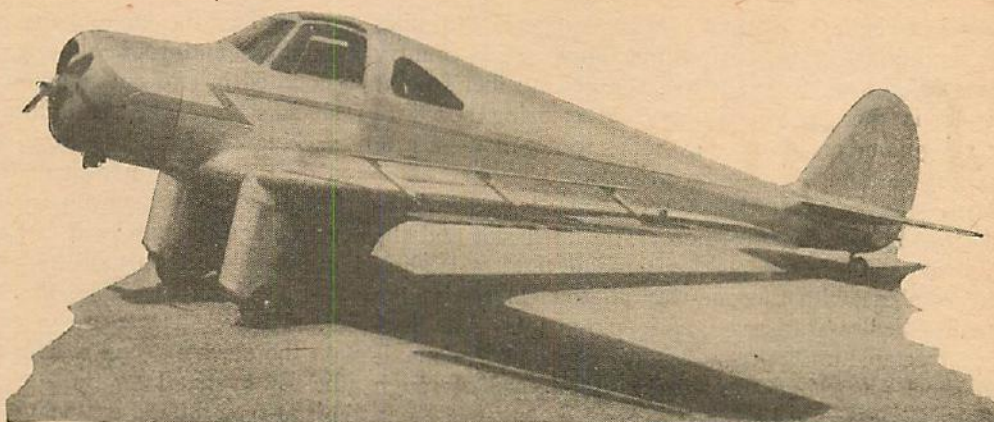
Why not scale down a transport plane to miniature size, they thought, thus offering the private flier most of the giant air liner's proved dependability? At the same time, give him a ship easy to handle and economical to operate.

It was hardly a case of "no sooner said than done." There were many problems to be solved first. Engineers of the Curtiss-Wright Airplane Company studied Mr. Vidal's specifications for the average man's ideal plane. If they were to succeed, they would have to meet those specifications, which in general demand simple, safe take-offs and landings, practically foolproof control in the air, freedom from accidental spins and stalls, and withal a fair rate of speed.

It was a difficult job, but a worthwhile one. In the first place, the bureau of air commerce would order 25 of the winning planes for the use of its own inspectors, thus launching the plane in the commercial market which it was intended to reach. In the second place, such a plane would encourage the average man to fly and therefore increase the nation's air-mindedness.

Curtiss-Wright were well fitted by previous experience to undertake the job. Back in 1929 they had designed a ship for the Guggenheim safe-aircraft competition that flew away with the \$100,000 prize and became the outstanding safe plane of the day. It was the famous Tanager, an unconventional three-place cabin biplane.

The Tanager's ailerons projected outward from the lower wing tips and floated free in the wind, aligned with the plane's path, when not under tension, thus providing ready control at any position or speed. Automatic slots along the wings' leading edges and controllable flaps along the trailing edges completed the Tanager's stability and maneuverability over a wide speed range. It had a 112-mile top and 15,000-foot ceiling. Its gas consumption was probably 10 gallons an hour or more at cruising speed with its Curtiss Challenger 6-cylinder 180 h.p. engine.



The Model 19L Coupé is as clean as its shadow.

The present transport idea required wholly a new design, however, and the bureau of air commerce, in addition, emphasized economy. Project Engineer C. W. Scott, under the supervision of Chief Engineer George A. Page, went to work. Two of the features that his predecessors, Robert R. Osborn and T. P. Wright, had incorporated in the design of the Tanager—namely, the wing slot and flaps—found a place on the drafting board, along with some typical transport structural ideas.

In the meantime, other companies and individuals were building ships that were at least partly inspired by the government's offer. Several of them have already appeared. Among them are the Arrow monoplane, the McGaffey AV-8, and the new Campbell pusher, all powered with automobile engines, and the Hammond Y and the Waterman pushers.

Curtiss-Wright's plane made its appearance recently as the most conventional-appearing of the lot—so pleasing to the eye, in fact, that you wonder at first glance if it can have all the performance tricks that seem natural to the odd-looking planes.

That it measures up to many of the government's hopes is indicated by the welcome it has received. Mr. Vidal himself flew the plane from St. Louis to Washington for testing, and said he was much pleased with it.

The new ship is known officially as the Model 19L Curtiss-Wright Coupé. It might be well called the Transport, Jr. It is of the same all-metal construction as the air liners and embodies the same structural principles. Although its speed, climb, and ceiling on a 90 h.p. engine are naturally less than those of its big brothers, it is equally as efficient on a comparative basis.

The Coupé is a two-place side-by-side all-metal stressed skin low-wing cabin monoplane. It has a top speed of 131 m.p.h., and a cruising speed of 115 m.p.h. at 5,000 feet. It lands at 44 m.p.h., which gives it a speed range of three to one. It climbs at 500 feet a minute and has a

DIMENSIONS

Wing span.....	35'
Length overall.....	25' 6½"
Height overall.....	7' 2"
Tread.....	7'
Wing area.....	174 sq. ft.
Wing loading.....	10.3 lbs./sq. ft.
Power loading.....	19.9 lbs./h.p.
Stabilizer area.....	18 sq. ft.
Elevator area.....	10 sq. ft.
Rudder area.....	4.5 sq. ft.
Total aileron area.....	11.9 sq. ft.

WEIGHTS

Weight empty.....	1,154 lbs.
Useful load.....	646 lbs.
Gross weight.....	1,800 lbs.
Fuel capacity.....	52 gals.
Oil capacity.....	5 gals.

PERFORMANCE

Maximum speed.....	131 m.p.h.
Cruising speed.....	115 m.p.h.
Rate of climb.....	500 ft./min.
Stalling speed.....	44 m.p.h.
Ceiling.....	17,000 ft.
Cruising range, normal.....	496 miles
Cruising range, maximum.....	1,150 miles
Fuel, cruising speed.....	5.8 gals./hour

17,000-foot ceiling. Normal cruising range is 496 miles and maximum 1150, permitting ample cross-country hops. Best of all, from the average private flier's point of view, is the gas consumption at cruising speed of only 5.8 gallons an hour, or 20 miles to a gallon—a rate as low as that of any popular-priced car.

As to safety characteristics, the Coupé leaves little to be desired by the average flier. The fixed slot and the flap on the wing, beside making possible the low landing speed, combine with the one-way ailerons to render the plane practically stall-proof and spin-proof. The partially retractable undergear, designed especially for maximum shock-absorbing effect, takes good care of rough landings.

Wings are swept back and tapered in chord and thickness. They are full cantilever, built up separately of five tubular spars and metal framing bearing a duralumin skin which carries the loads. The wings are bolted to the fuselage and to each other. The ailerons, attached by full-length piano-type hinges, move only upward from the neutral position in order to improve control safety.

Beneath the trailing edge of the wing, a split flap extending for 70 per cent of the span is operated at will from the cabin by a rotating handle, like an automobile window lift, located at the pilot's right near the bottom of the seat. Torque tubes make the load on the flap handle almost constant regardless of air load.

The fixed slots provided by the narrow auxiliary airfoil surfaces anchored above and ahead of the leading edges, of the same approximate span as the ailerons, work in the usual way to smooth the air flow over the wing at steep angles and safely increase the lift.



Curtiss-Wright's earlier safe plane—the Tanager.

The fuselage is of monocoque, or load-bearing shell, construction. Former rings in elliptical shape and light longitudinal stringers stiffen the riveted 24 ST Alclad metal skin used on both fuselage and wings—the same heavy-gauge sheet from which the giant transports are built.

Dual controls face the side-by-side seats in the cabin. The columns are of the inverted type, hinged behind the instrument panel, with the wheel shafts sliding through a panel bearing so that there is plenty of foot room in the cockpit. One control may be easily disconnected, if desired.

Visibility for the pilot is excellent, due to the low

position of the engine, the sloping windshield, the side windows and roof window, and the rear-view mirrors mounted in two automobile-type ventilators at the windshield's top. The ventilators are of the no-draft variety, sucking air from the cabin that is introduced fresh by a duct opening in front of the engine.

Large doors open on each seat. Behind the seats is a baggage compartment. Spring cushions and individual upholstery are part of the fixings.

In the tail assembly, the stabilizer and fin are of the fixed type. There are mechanically operated trim tabs on the elevators and a trim tab on the rudder that may be set by hand on the ground. The elevators have a piano-type hinge extending from the tip to the root section.

The landing gear is of full monocoque design, using oleo shock absorbers providing a 10-inch stroke, and full Goodyear air wheels. The landing gear is normally held up in the take-off, or raised, position by a small latch in the oleo strut which is automatically released when the flap handle is given its first turn. This assures the oleo gear being extended to receive the impact as soon as the flap "air brake" is put into action for a landing. Hydraulic foot brakes work from foot pedals for landing or taxiing; for parking, they are operated by a simple sliding control on the instrument board that turns a screw stop on the hydraulic cylinder.

The Coupé is powered by a Lambert R-266 5-cylinder radial air-cooled engine producing 90 h.p. at 2,375 r.p.m. It is mounted on a steel tubular structure and supported with rubber bushings to absorb vibration.

Service or repairs to the engine are made as easily as in an automobile by means of simplified cowling. The cowl is so designed that no part attaches directly to the engine, allowing the engine to move freely inside the shell. Steel tubes from the engine mount support it. A piano-type hinge along the top divides it into two sides, either of which can be lifted and propped. If desired, the whole cowl may be completely removed from the engine by taking out three small pins which hold the hinge to a steel supporting tube.

Fuel capacity totals 52 gallons. It is contained in two tanks, located on either side of the fuselage in the wing. Of the supply in the left-hand tank, 6 gallons is held in reserve. The oil tank, of 5 gallons capacity, is attached to the fire wall directly behind the engine.

There you have a summary of the Coupé. How would you like to own one?

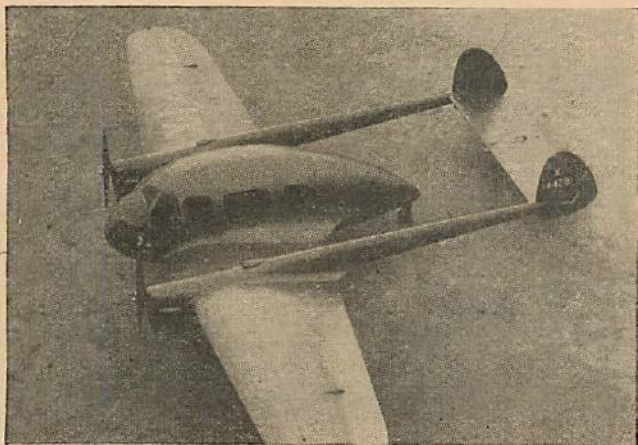
If you would, then the Curtiss-Wright people have already succeeded, at least in part, in their endeavor to design a plane that will appeal to the average beginning flier.

It is good looking—a quality lacking in the Flying Flea, one of the hopeful light planes of the moment—reasonably safe, and efficient.

The low price sought by the bureau of air commerce depends on the public. Curtiss-Wright chose the all-metal transport idea not only for its inherent worth, but also because it permits low-cost mass production. If the demand is big enough, inexpensive Coupés can roll from the factory in a steady stream!

AIR TRAILS GALLERY

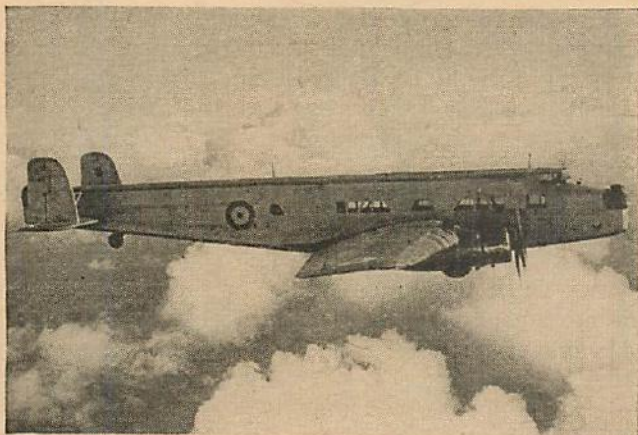
A Picture Page of Modern Planes for the Collector



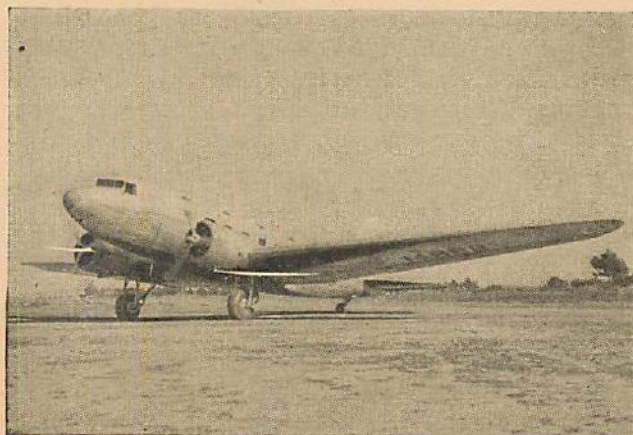
CRUSADER of American Gyro Co., with 4-seat teardrop cabin, mounts 2 150-h.p. Menascos on tail booms. Controllable props promise 230 m.p.h.



CAMPBELL all-metal tail-boom 2-seat pusher, newest safe plane for government, cruises at 110 on auto engine yielding 22 miles per gallon.



ARMSTRONG-WHITWORTH 80-foot-long 2-engined AW XXIII, testing for England, has nose and tail gun turrets, carries troops, drops bombs.



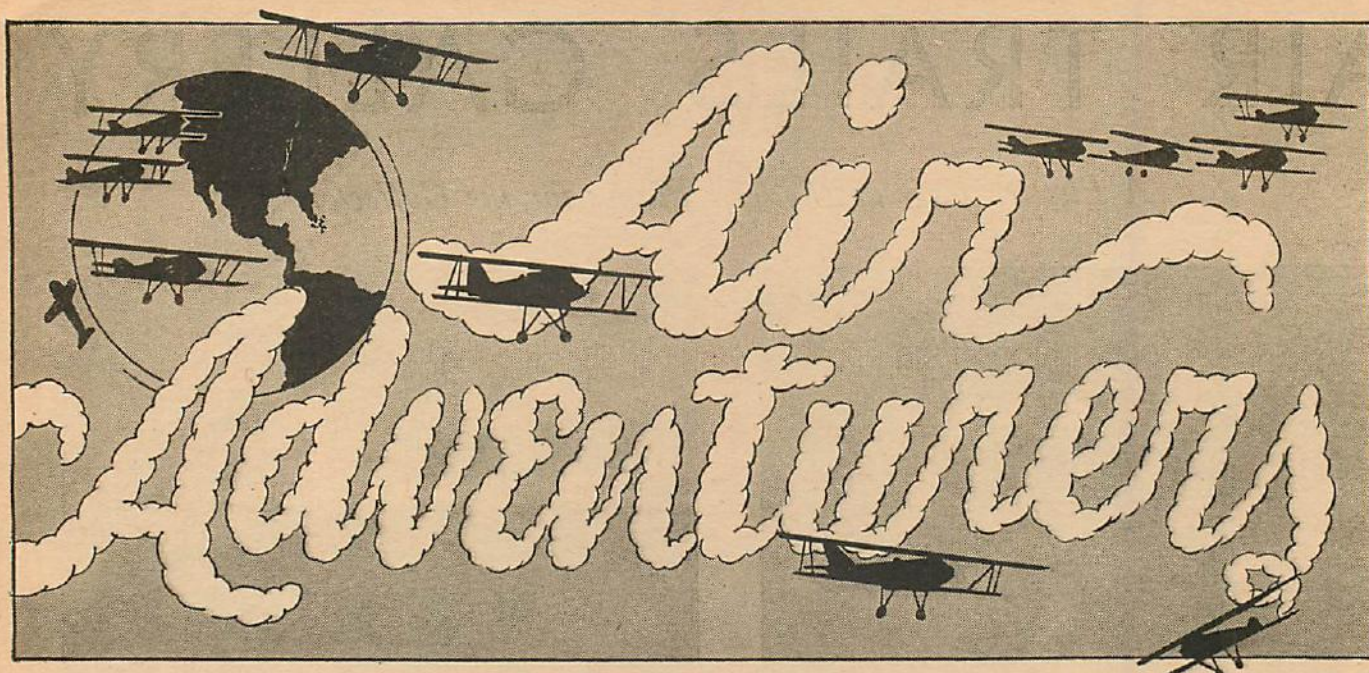
DOUGLAS new 24-passenger DC-3, sleeping 16 at night, is largest U. S. land plane to date. Spanning 95 feet, 65 feet long, it weighs 12 tons.



MORANE-SAULNIER 227, frail but deadly, does over 200 m.p.h. and hurls explosive shells through prop hub of cannon engine shown on page 5.



GRUMMAN JF-3 is latest of navy's amphibian general utility series. Powered by a Wright engine, it operates from sea, catapult or carrier deck.



Moving the Mountain

DID you ever take hold of something big and heavy that you wanted to move, exert all your strength, and find that you couldn't budge it? Too much of a job, you decided. Then along came a couple of your pals. They grabbed hold, too, and when you all tried together, the thing moved easily. Where one pair of hands had failed, many pairs succeeded.

Every one has had that experience, but how often has he seen the lesson in it? Maybe "lesson" is a disagreeable word to use; perhaps it reminds you of dull school books and classrooms. But lessons go beyond school walls. Growing up means simply learning the lessons that life offers us. The fellow who uses his eyes and his brain, who learns from what happens to him, is going to make a real man.

Working together is the basis of our Air Adventurers Club. In this world of ours to-day, with its millions and millions of people, no one man can accomplish much by himself. If he wants to do something big, he's got to have help—and the bigger the job, the more help he needs. That goes, whether the job is one that requires hands or just brains.

As Air Adventurers, our big job is to help the advance of aviation. If others whom we meet think it isn't a big job, just ask them to look around them. Ask them how many people, whom they know, have declined to ride in an airplane when they had the chance. Ask them how many think first of using other and slower means of transportation when they want to go some place, instead of the air lines. They'll answer that a lot of people are still timid about air travel. They have to admit that many persons are still living, mentally, in the horse-and-carriage days.

That shows that our job exists, and it's a real one. While aeronautical scientists and airplane designers and pilots are pushing the fight along one front, we've got to batter down people's indifference and prejudice in our own sector.

Individually and separately as aviation fans, we might

not succeed. Banded together as Air Adventurers, we can move mountains. Each of us can be encouraged in his task by the knowledge that thousands of fellow members everywhere, wearing the Air Adventurers' badge, are working with him. Back of him, giving strength and reputation, is a great magazine, Bill Barnes-AIR TRAILS, and a great organization.

Air Adventurer members are, and will continue to be, lone eagles. Each of us keeps his own individuality and shapes his own flight. But all of us are united by the same ideals and the same goal.

It's not much fun being on the outside looking in. If you are among those new readers who can honestly uphold our seven-point Creed—Self-Reliance, Courage, Initiative, Independence, Loyalty, Integrity, and Obedience—I invite you to send to headquarters the coupon below. If your application is approved, you will be worthy of joining us.

Let's help clear the path for aviation progress—together!

Your Flight Commander,

Albert J. Carlson

(MEMBERSHIP COUPON)

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I am interested in aviation and its future developments. To the best of my ability I pledge myself to support the principles and ideals of AIR ADVENTURERS and will do all in my power to further the advance of aviation.

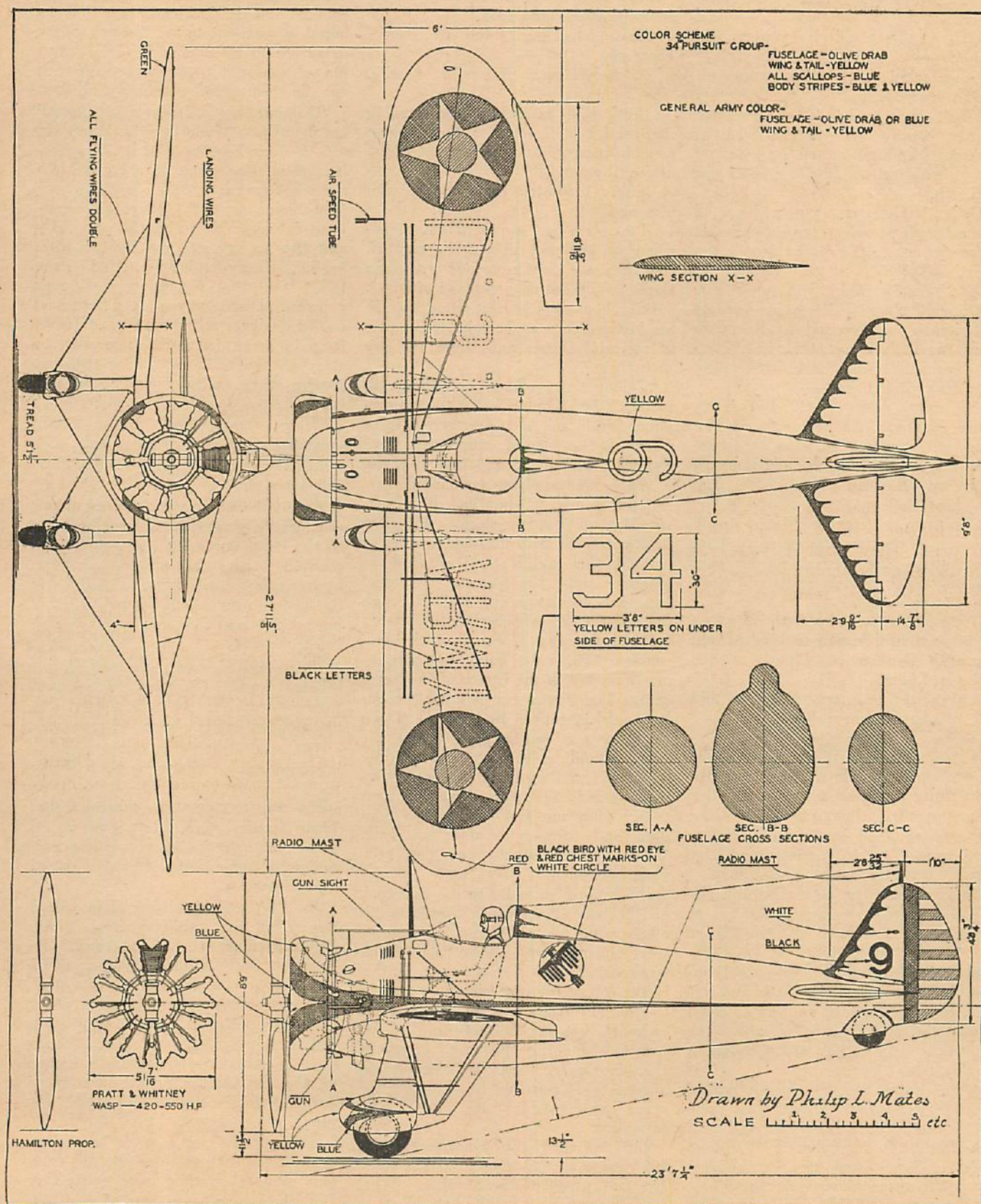
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num design, it's a tough ship for enemy gunners to down. The Boeing P-26A, shown here in complete detail and in flight on page 5, makes an easily constructed model that should be in every solid-model builder's fleet.

THE SILENT FLEET

(Continued from page 16)

"Where are you, kid?" he asked Sandy.

"Wait a minute, I'll give you my position if—"

"Never mind that," Bill interrupted. "Just a general idea."

"I'll sit down at Rochester in twenty minutes," Sandy said. "I was over the Allegheny Mountains when Tony picked me up. I kicked the Eaglet around and cut north."

"O. K., kid. I want you with us. I have a hunch we might run into trouble before we get to Toronto. How's the Eaglet doing?"

"Bill," Sandy said, "you never saw anything like her!" His voice became high-pitched and excited as he spoke about the little comet that had, literally, been built around him. "She's got everything, Bill! She—"

"All right! All right!" Bill interrupted, laughing. "It seems to me I've heard you mention the same thing before. Stick close to your radiophone in Rochester. I'll pick you up later. I'm signing off."

A few minutes later Bev Bates' steady voice came through the ether to him. He could picture Bev riding his ship with that cool, detached attitude characteristic of him.

"We ought to be over Albany at about the same time if you're cruising at two hundred," Bev said. "What's on the memo pad, Bill?"

"Cyrus Steel is in trouble again," Bill said. "You remember him?"

"Rather!" Bev said.

It was amusing, Bill mused, as he signed off, to watch people meet Bev and form an opinion about him. But it was more amusing to see them after they had seen the brown-eyed, fearless Bostonian in action. Sometimes they couldn't believe it was the same man.

An hour later the little squadron circled the airport above Rochester as Sandy Sanders whipped his little Eaglet into the air. Leveling off at ten thousand feet Bill took a position a thousand feet above and in front of the rest of them. Below him and a thousand feet behind, Red Gleason sat above the V formed by the planes of Cy Hawkins, Bev Bates and Sandy.

As the waters of Lake Ontario flashed beneath them Bill flipped his radio switch and chanted Tony Lamport's call letters into the microphone.

When Tony gave him an all-clear signal Bill asked him about Shorty.

"Not a word, Bill," Tony said. "I've been waiting for the call. I'll shoot it along to you the minute I hear from him."

"That's funny," Bill said, frowning. "Keep—"

"Where are you?" Tony asked.

"Over Lake Ontario," Bill said. "We'll sit down at Toronto soon."

"Have some one stand by there," Tony said. "I'll—"

"O. K., Tony," Bill said, hastily. "Red's cutting in!"

"Bill!" Red said, his voice coming crisp and a little tense. "Notice those two biplanes off to starboard, at about fifteen thousand?"

"Sure. I spotted them a few minutes ago."

"Two more just appeared out of nowhere on our port side, flying parallel. And there are three more just in the sun above us! What do you make of it?"

Bill's blue eyes became mere slits in his bronzed face as he adjusted a pair of powerful glasses and swept the sky with them.

"Calling all planes! Calling all planes!" he shouted into the microphone after he had discovered three more of the rugged amphibians five thousand feet above and behind them.

"There are ten planes surrounding us," he said, grimly. "They look like Marvin Mystery Cannon ships. But they don't carry the British insignia. They're painted blue and if they are Marvin Mystery ships they mount a 20mm. gun that fires explosive shells through the bore in the propeller shaft that lies between the two blocks of their 'vee' engines. They also carry two Brownings mounted in the center of the lower wing. The 20mm. gun is much heavier than our .50-caliber Brownings. Those ships have a terrific fire toward the front, but all of their guns are rigidly mounted. If they attack us—and they look suspicious—try to keep on their tails. They are fast—about two hundred and forty-eight miles an hour. We'll be over Toronto soon, but keep your eyes open."

Bill flipped his radio switch and took up his binoculars again. Suddenly his whole body tensed. The leader of the three biplanes above and in front of him was rocking his ship to get the attention of the rest of the blue planes.

The red call light on Bill's radio panel gleamed, but he did not see it. He was watching the "tail-wag" signals of the blue leader. He saw him flip his ailerons and knew that he meant for the other nine ships to come into a close formation.

Bill snatched the binoculars away from his eyes and glanced down under the gull wings of his Stormer. What he saw caused a white-hot blast of words to jump out of his mouth. Sandy and Red Gleason were reversing their direction and losing altitude! The worst thing in the world they could do if the blue planes above them meant to attack!

Bill threw his radio switch and shouted into it. At the same time he heard a voice not unlike his own giving directions to his own men! He listened for a fraction of a second then drowned out the other voice with his own bellow.

"Disregard any orders you just heard!" he shouted. "Some one has tuned in on our wave length. This is Bill speaking. The ships above us are going into a close formation. All of you get up here beside me fast. Form an arrow-head column. I'll be at the peak. Cy and Bev on my left and right, a little behind. Sandy behind me. Red on the tail. Hold that formation as long as you can. Disregard the radio from now on. I'll signal with tail-wags. If we have to break formation, remember to stay on their tails. If one of their explosive shells catches you, it'll be just too bad."

"Here they come, Bill!" Sandy screamed at the top of his voice.

"All the speed you have—and climb!" Bill shouted.

The ten blue planes had formed in two echelons, five planes to the left and five to the right, one a little above and behind the other. The sun was on their backs as they nosed down. But Bill saw the leader's arm extending upward above his cockpit and saw him rock his ship before he dove.

He rocked his own plane and dipped his right wing. The little red squadron followed him as he power-dived the Stormer and made a ninety-degree turn.

The concentrated fire of the ten diving ships and the chatter of their twenty machine guns was terrific. But their speed was too great for accurate fire. Their tracers wove white patterns of death through the sky as Bill's men completed their turns and pulled out of their dives.

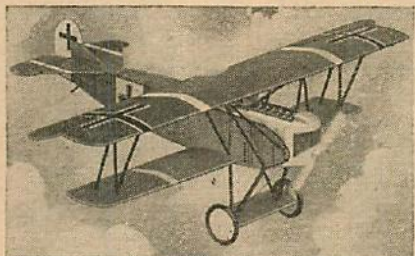
As the ten lead-spitting ships passed below, Bill grew faintly puzzled. There was something queer about them. No bellowing roar of diving motors sifted through the thunder of his own Diesel. But there was no time to think about that now. He rocked his ship again and fishtailed his rudder. The little arrowhead column swung around and dove on the ten blue ships with the speed and fury of five hawks diving on their prey.

Their powerful .50-caliber guns belched fire and death as the two echelons pivoted on their axes to the left. But their pivot was started too late. Bullets tore into their tail surfaces and crept forward to their cockpits. A white face peered back and up as one of the blue ships yawed wildly and crashed into the one next to it. The two mangled ships locked in one another's arms

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and began a dizzy descent to the waters of Ontario.

The blood was singing through Bill's body as he saw the three remaining ships in the right echelon close up their formation in answer to the flipping ailerons of their leader. His own arrowhead column was below the enemy now and turning with them to the left. He stuck the nose of the Stormer up sharply in a swift climb to indicate that his men were to get altitude. He looked back and saw that Red Gleason was grinning and holding his thumbs up. That meant that everything was going O. K. He stuck one arm in the air with his thumb sticking up. Four thumbs jutted upward from the four Snorters.

Then Bill saw the leader of the blue ships rock, fishtail his rudder and rock his ship again. That meant the two echelons were going to attack separately. As they swung in different directions in a turn they stuck their noses down and converged their fire. Bill gave the signal his men had been waiting for. He dove sharply and then zoomed upward.

The five amphibians in the arrowhead column became five separate bolts of fire and death as they broke their formation and whirled out of the murderous fire of the eight attacking planes.

Bill's mouth became a firm, hard line

across his face as he whipped the Scarlet Stormer upward and over on its back. What had been a plane, no faster than the rugged blue amphibians, became a streak of crimson light.

The eight blue planes were concentrating on Bill's ship, at the same time trying to avoid the desperate fire of his men. They were forming a circle around him, trying to get him into the vortex of their fire. He whipped up again in a chandelle and dove at them head-on with the wild fury and abandon of a bird gone mad. They dove and zoomed and skidded and rolled to get out of his flaming path. His fingers fastened down hard on his gun trips as a blue plane came under his hair sights. The pilot popped upward with his arms swinging wildly, then dove over the side as the ship slipped off to the right and the nose dropped.

Bill was talking to himself now, shouting orders at his men, words he did not know he was saying. He gunned his engine again and came over in a normal loop on the tail of another plane. His line of tracers curled above the head of the pilot. His bullets tore into the fuselage and crept into the engine block. Little wisps of smoke rose along the engine housing as he zoomed upward.

Then the air became choked with slashing, flashing blue biplanes and scar-

let-and-yellow monoplanes. Guns sang their songs of death and hate.

Bill knew that he and his men were fighting with pilots skilled in the art of death—more skilled and desperate than any they had ever encountered before. As their ranks were cut in half they fought more desperately, showing no sign of turning tail against the superiority of Bill's Stormer and the darting Snorters.

Then Bill saw something that brought his heart up into his mouth. The muscles in his cheeks stood out like whipcord as he saw one of his own planes tumbling over and over in the air. He jammed the stick of the Stormer forward and nosed down as close to the falling plane as he dared. He saw the white, twisted face of Bev Bates in the cockpit of the whirling plane as the cockpit swung toward him. He saw that Bev was struggling with his safety strap, trying to loosen it.

Then he saw one of the blue planes diving on Bev with its guns firing burst after burst into the stricken Snorter. A wing flew into shreds as one of the shells made a hit. Rage such as he had never known before suffused him. Bill whipped the Stormer around and headed for the blue amphibian with his throttle open wide and his guns belching death. He held the nose of the Stormer head-

on until it seemed there was no escaping a collision that would mean sure death. His bullets tore into the blue ship, into the pilot's head and body. Then he yanked back on his stick, flicking the top wing of the blue ship with the belly of the Stormer.

Inwardly sick and half mad with anxiety over Bev, he stuck the nose of the Stormer down again toward the whirling red Snorter. Then he saw a white-clad figure struggling up out of the pilot's seat, fighting with all his strength to overcome the centrifugal force of the falling plane. Saw him get one leg over the edge, an arm. Saw him roll out to shoot clear of the whirling wing and tail.

Bill saw Bev Bates' body turning lazily over and over and waited, breathlessly, for him to pull his release cord. But Bates didn't pull his release cord. Seconds became hours as Bev fell closer and closer to the waters below.

Then Bill's breath exhaled from his body with the sound of escaping steam as he saw the pilot 'chute on Bev's back snap out and pull out the main 'chute. He saw Bev wave an arm upward in salute as he began a slow descent, pulling in on the shrouds to prevent oscillation.

At the same instant Bill was conscious that the guns that had been chattering overhead were silent. He saw two blue planes streaking off to the south with Sandy and Cy Hawkins in pursuit. He flipped his radio switch and bellowed into it.

"Come on back, you apes!" he shouted. "They've had enough. Bev's down, wounded. Stand by, Red. I'm going to pick him up."

A few minutes later Bill slapped the Stormer down on the waters of Lake Ontario, thankful that the water was calm. He taxied close to Bev and hopped out on a wing. As he caught the end of the floating parachute he saw that Bev was half drowned and nearly unconscious.

Bill pulled him on the wing and loosened his parachute harness. Then he lifted him on his shoulder and slid him into the little cabin.

"Where did they get you, fella?" Bill asked him, as he took a first-aid kit out of a compartment in the rear.

"It's nothing much, Bill," Bev said, grinning a sickly grin. "Through the right shoulder."

Bill's face twisted in agony as he saw the jagged hole a machine gun slug had torn through Bev's shoulder. He knew that the bones were shattered. It wasn't just a flesh wound that would be all right in a couple of days. He dressed it as best he could, and as carefully.

"Your radio, Bill," Bev gasped, pointing his good arm.

Bill flipped the switch and heard the voice of Tony Lamport chanting into the microphone.

"Bill speaking!" he said, sharply.

"Bill!" Tony said, excitedly. "I've been trying to get you for half an hour."

"I've been busy," Bill said. Bev Bates managed a grin.

"I got in touch with Steel in Toronto finally. And he doesn't know anything about that telegram, Bill! He says he didn't send it!"

Bill's stomach turned over. He looked at Bev Bates with eyes that were smoldering with rage.

"Listen, Tony. O. K. That message was a fake. Some one wanted to get us up here over Lake Ontario and murder us where they wouldn't have any witnesses. We were attacked by ten fast, blue amphibians—biplanes. They looked like British Marvin Mystery ships, armed with 20mm. cannons and machine guns on the wings. Two of 'em got away. Send out the warning and try to have 'em picked up."

"Right, Bill."

"And have the ambulance and a doctor on the apron when I get back there in an hour. Bev Bates has a nasty wound in his shoulder. Bones and all. Get it? We're all coming back now. But I'll be there in an hour. Signing off, Tony."

"All clear, Bill."

Bill waited a moment and spoke into the microphone again. "Calling all planes," he said. They checked in one by one.

"I'm going to open up the Stormer and get back to the field. The rest of you follow me. Keep your eyes open. Red, you take command."

He flipped over the radio switch and arranged Bev's arm as comfortably as possible. Then he set the flaps of the Stormer well down and took it off the waters of Ontario with the speed of light.

At five thousand feet he leveled off and eased the throttle open slowly. When the Scarlet Stormer was doing three hundred and seventy miles an hour he locked the controls and turned around to see if there was anything he could do for Bev.

Bev's head was slouched forward on his chest. Bill spoke to him quickly, then realized that he was unconscious. He pounded one fist into the palm of his other hand as he thought of the murderers in those blue amphibians.

Rage crept over him until he was at the point of choking. Who was behind the whole thing? Criminals, of course. Another madman who wanted money or power beyond reason. Some one who knew he was going to be called on to suppress him. Some one on the inside as usual. Probably some one no one would suspect.

Who had sent Temple to him?

That thought brought Shorty into his mind. What had happened to him? Tony hadn't mentioned him. He reached for the radio switch. But before he opened it the light on the radio

panel gleamed red. He flipped the switch and heard Tony's voice again. Only this time it was high-pitched and shrill, and full of fear.

"Bill speaking!" he shouted.

"We're being bombed, Bill!" Tony yelled. "A twin-motored bomber painted light-blue came over a few minutes ago. It was silenced! A silent bomber, Bill! The sound detectors didn't pick it up until it was almost overhead. They've wrecked the hangars and the machine shop. Scotty and McCoy and Neely each got a Snorter into the air. But they were too late. The bomber got away before they could get their ships warmed up. The place is a wreck!"

Bill, by an effort of will, suppressed his own excitement. It came back to him that he had heard no roar from the blue planes' engines. Silenced! He clenched his fists, but he spoke calmly.

"What about the runways?" he asked.

"Are they all right? Can we get in all right? What about the hospital and the doctor? Bev's unconscious."

"You can get in all right, Bill. You'll have to stop short of the apron. The ambulance and the hospital are all right. So is your bungalow and the living quarters. They concentrated on the hangars. They must have known the layout. Scotty had three new Snorters out on the apron or they would have gone up with the old ones. There was a fire for a few minutes, but the fire crew put it out," Tony finished.

"I'll be there in thirty minutes," Bill said. "What about Shorty? Have you heard from him?"

"Not a word, Bill. He hasn't called in."

Again something turned over in the pit of Bill's stomach. One Snorter shot down; Bev seriously wounded; his hangars and workshops destroyed, with goodness only knew how much damage to his planes. He wondered about the bomber transport. But he didn't get Tony on the radiophone to ask him. He didn't want to know. If it had been destroyed it would be too much to stand. And Shorty gone and unaccounted for!

He wished he could get his hands on Temple. He'd wring the truth out of him if he had to half kill him. Now he had a real interest in the job that was going to be offered to him.

One that wouldn't be satisfied until the persons behind the attacks on him were dead or in jail.

V—INSIDE THE EARTH

THE TALL, debonair pilot of the speeding cabin plane shifted to a more comfortable position in his seat and glanced back at the trussed form of Shorty Hassfurth. Shorty's face was battered and cut and when he opened his eyes they were the eyes of a man in a trance. His face twisted with pain

as he tried to make himself comfortable. He studied the sneering face of the pilot as though he was trying to think where he had seen him before.

The pilot, Adrian Temple, laughed sardonically as he watched Shorty's befuddled efforts.

"Just a dumb cluck," Temple said. "Having read so much about you in the papers I had the idea you were reasonably bright. Then you walk in and let us take you, just like nothing. And you're supposed to be one of Bill Barnes' brightest boys."

Shorty's confused gaze wandered about the cabin and swept the instrument board as the fast cabin biplane sped above the flat, green fields of lower New Jersey. What was missing? There was something strange. The pilot's voice was so loud.

Farmers working in the fields stopped to look upward at the blue ship as it winged its way southward. Some of them waved a hand. But Temple did not wave back to them. His forehead was furrowed with little ridges as he probed the air ahead and took his bearings.

He leaned forward and chanted into his microphone: "Calling Q-4. . . . Calling Q-4. . . . Calling Q-4."

In a moment a voice came back to him through the ether. A voice that was indistinct and blurred.

"Q-4 answering," came the voice. "Q-4 answering."

"Q-2 speaking. . . . Q-2 speaking. Am over south Jersey. Will arrive at Port One in one hour. Have everything ready. Have everything ready."

"Wind O. K.," the voice answered. "Ten biplanes left for the North two

hours ago as you ordered. They have sighted B. B. Am waiting for further report."

"Q-6 lead them?" Temple asked.

"That's right. Call coming in. All clear. Q-4 sending all clear."

"Q-2 sending all clear," Temple replied.

He turned around and spoke to Shorty Hassfurth.

"You'd better cross your fingers, cluck," he said. "Your pal Bill Barnes is just about to take what he has been dishing out so long."

Shorty's eyes cleared for a moment at the mention of Bill's name. Then his gaze wandered again. His head rolled and his eyes became the vacant, stupid eyes of an idiot.

"They'll be fishing Bill Barnes and his gang out of Lake Ontario in pieces to-morrow, if they find him," Temple gloated, half to himself.

He kicked the plane around and took a course almost due west as it flashed above the tip of Delaware Bay and over the city of Wilmington. For half an hour, after he had passed the spot where the States of Pennsylvania, Maryland and Delaware meet, he flew due west on an imaginary line between Maryland and Pennsylvania, until the Cumberland Mountains loomed purple and blue in the mist to the west. Then he altered his course again to the southwest and reached for his radio switch.

"Calling Q-4. . . . Calling Q-4," he chanted.

"Q-4 answering," a voice came back in a moment.

"Q-2 will be ready to enter Port One within five minutes," he said. "Keep contact."

"Q-4 will hold contact," the voice came back. "Everything ready."

Shorty Hassfurth shook his head angrily as he listened to Temple's words. Although his eyes were beginning to clear now, he still had the expression of a boxer who has taken a hard blow on the chin—a blow hard enough to daze him, but not knock him out. He was trying desperately to put his thoughts together so that they had continuity and made sense. The plane or the radio did not astonish him. Even his subconscious mind was used to both of them. He was in the air. But there was no engine noise. Were they throttled down in a glide? There was a subdued propeller whine. It was a puzzle. And who was the man in front of him, and why were his own legs and arms trussed?

Suddenly the face of Bill Barnes flashed before his mental vision. Then the face of Red Gleason and young Sandy Sanders, the planes they flew, Barnes Field, his Snorter, Bill's Stormer. They all passed in a kaleidoscopic picture that was at first jumbled and distorted. Then he began to laboriously put them together so that the parts fitted. As things began to make sense he cursed angrily and tried to stretch his body up far enough to see through the windshield. What he saw brought a gasp of horror from his lips. His eyes left the mountain towering above them a half mile away and raced to the air-speed indicator. The plane was doing sixty miles an hour and headed straight for the side of the mountain!

Temple swung around in his seat and laughed at Shorty's expression.

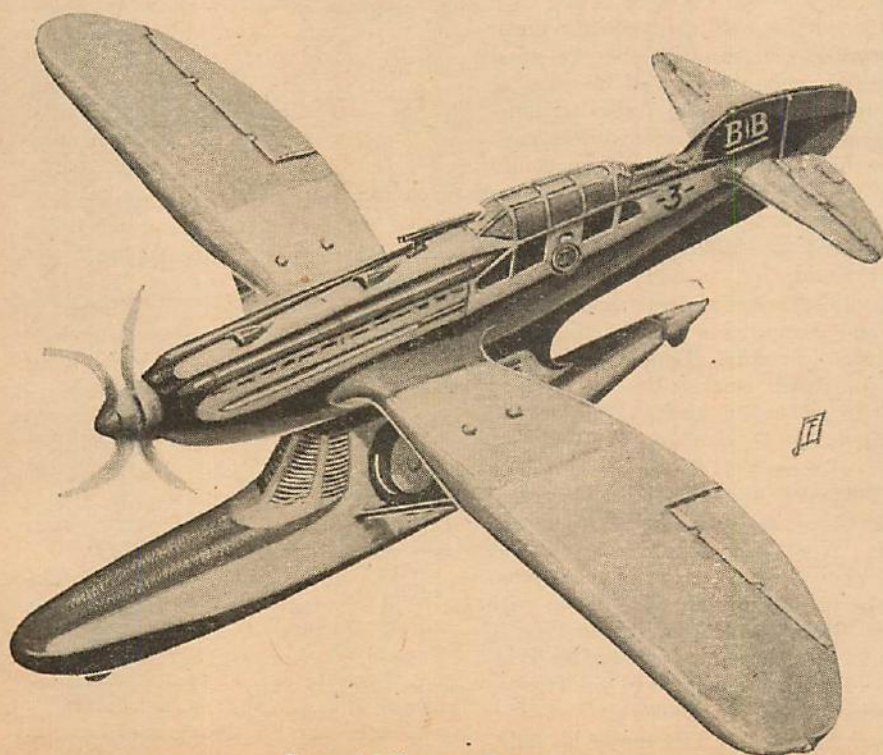
"The dope's wearing off, eh?" he said. "Well, we'll fix that in a few minutes."

Suddenly Shorty saw the side of the mountain open up as though it were on a roller. What appeared to be a square of boulders and trees shot upward leaving a great gaping hole in the side of the hill. A hole that was a hundred feet deep and two hundred wide.

Temple eased his stick forward and nosed the little plane down. As it swished through the hole, the landing wheels and tail skid touched the tarmac floor in a perfect landing. The plane rolled along for a matter of a hundred feet, when it was suddenly slowed up and stopped as though an invisible hand had reached out of the dimly lighted cavern to stop it.

Shorty gazed with unbelieving eyes at the things he could see from his seat in the cabin plane. He shook his head and wondered if this, too, were part of the mental daze in which he had been for the past few hours. Were the small, rugged, blue biplanes he saw stretching out endlessly on the floor of the cavern a figment of a madman's dream or were they real? Was the great cavern airport real?

He stared at Temple with incredulous



One of Bill's new Snorters.

eyes as Temple cut his switch and swung around with a sneering smile on his lips.

"Where are we?" Shorty asked through swollen, battered lips.

"You're inside the greatest airport in America, cluck," Temple said. "An airport that makes Barnes Field look like a child's plaything." He pointed a finger at the string of blue pursuit ships backed up against a wall of the great cathedrallike cavern. "There are a hundred of the fastest fighting ships in the world," he went on. "And all armed to the teeth. Silenced, all of 'em, with a trick muffler that can be cut in when needed, and special props. If the ten I sent out this morning can't take care of Bill Barnes I'll send eighty to do it. And that's only half of it, cluck. You'll learn more about it when the time comes."

He turned and spoke to the tall gray-faced man who opened the door of the plane. "Get a couple of men to take this cluck into the brig and lock him up," he ordered.

As two giants lifted Shorty out of his seat he tried to struggle. One of the men back-handed him across the mouth so hard that blood began to trickle down his face. Temple laughed as they threw him out on the tarmac floor. He pointed at a half dozen planes being wheeled toward the rear of the half-mile cavern.

"Those ships are going out on their routes to deliver their papers," Temple laughed boastfully. "Two of 'em are going to South America. We sell a lot of our papers in South America. One is going to Boston. They like to read up there. One is going to the West coast. Los Angeles is a great town for news. And the other one is going to Chicago. Each one of 'em carries a half a million dollars worth of papers, cluck."

Shorty could only stare. He stared at the six ships and he stared at Temple. His lips formed the word, "Papers?"

"Dope, cluck! Dope! You're calling on the largest dope distributing ring in the world. We fly it in and we fly it out. If you have any sense when the boss gets ready to talk to you you'll be flying it, too, before long. The boss is a reasonable man if you show sense. If you don't—" Temple laughed again and drew his forefinger across his throat.

Shorty's two guards and the man with the long, gray face removed the wire that bound his legs together and motioned for him to follow them. They led him up three or four concrete steps off to the right and into a smaller cavern which was lighted with huge lights on the limestone walls and ceilings. Great stalagmite formations crouched on the bottom of the cavern on each side of the concrete walk, taking weird forms in the shadows.

Where water had seeped down through the tiny crevices and interstices

in the roof it had dissolved the lime and minerals in the earth to deposit calcium carbonate particles on the ceiling that had built up into fantastic stalactites. Here and there the stalagmites and stalactites had joined to form columns or pilasters.

Shorty shivered as his guards led him along the concrete walks that spanned great crevices in the earth below. He had read about the great natural caverns that existed and were constantly being found in Pennsylvania, Maryland and Virginia. But he had never been in one before. The immensity of this one astounded him. It was as though a great shovel had scooped a hole inside the bowels of the earth. Great natural bridges formed by pieces of limestone weighing hundreds of tons furnished a means of getting over the crevices. Concrete walks had been laid on top of the pieces of limestone. The place was like a natural underground city, like an enlarged subway without the roar of trains to break the complete and terrible silence.

He tried to talk to his guards, tried to ask them questions. But they, too, answered him only with silence. Just the grating scuff of their footsteps on the concrete.

At the top of a column of stairs he was pushed through an iron door that one of the guards unlocked. A huge cage with a floor was set on the end of a great piece of limestone that had fallen there thousands upon thousands of years before. A glaring light shone from a position on the ceiling of limestone, outside the cage. There was a cot and a chair in the cage. That was all.

The men locked the door of the cage on the outside and went silently down the concrete steps again. Shorty stood gazing through the bars of his cage at the unique and colorful stalactite, flowstone and crystal formations in the cave below him. Here they had formed into what looked like a cluster of grapes, there a crystal fountain of frozen ice, grotesquely resembling objects in the outer world.

He walked over and sat down on the cot and dropped his head in his hands. He was just what Temple had called him—a dumb cluck. He had walked right in and asked for it. Well, he had got it.

There wasn't a chance in a million of Bill ever finding him. They had taken him so easily, as Temple had said. What was behind it? Temple said they were dope peddlers. What did he or Bill Barnes have to do with that? He wished he had taken time to talk to Bill before he started after Temple. Then he might have an idea as to what it was all about.

And Temple had sent ten of his fighters after Bill. And was willing to send

eighty more if ten weren't enough. Shorty groaned. He, Shorty Hassfurth, was certainly a lot of help!

Temple stood on the tarmac of the indoor flying field and watched the six dope-carrying biplanes speed down the runway and lift their noses noiselessly into the air as they cleared the outer edge of the cavern.

Then he walked about two hundred feet off to his left and pulled open a door that led into a large, low building that was divided into a half dozen beautifully appointed offices.

As he walked into one of the offices, a man sitting at a desk with a telephone in his hand motioned to him.

"It's Q-1," the man said. "Do you want to talk to him?"

Temple nodded his head and reached for the telephone. He knew it wasn't a question of whether he wanted to talk to Q-1. He knew it might cost him his life if he didn't talk to him.

"Q-2 speaking," he said into the mouthpiece.

"Report!" Q-1 said, briefly.

"I have Hassfurth a prisoner here," he said. "Barnes is on his way to Toronto, called there by a telegram which I sent according to directions. He will be met over Lake Ontario, or has been met by this time. Ten of our best pilots. I am expecting a report any minute. I will report as soon as I have word."

"Get Hassfurth ready for questioning," Q-1 directed, his nicely modulated voice coming clearly over the telephone. "That is all."

Temple put the telephone on its hook as another man came rushing into the room. He was the tall gray-faced man who had placed Shorty inside the steel cage. His face was white now, white and pasty.

"I just had a message from Q-6," he gasped. "He reports that Barnes shot down all of his men but one and himself. He said he had never seen anything like the performance of Barnes' Scarlet Stormer. He says it will take a dozen men to get Barnes alone."

Temple's face was as hard as white granite now. His eyes bored into the eyes of the gray-faced man as though they would sear holes through his brain. His hands twitched as he lighted a cigarette.

"Get twelve planes ready and I'll pick twelve pilots," he said, sharply. "I'll have to work out a way to get Barnes in the air alone. What about the men you sent to bomb Barnes Field?"

"They were successful. They destroyed his hangars and workshops as you directed."

"Good!" Temple said. "That will help some with the boss. There is going to be hell to pay when he learns about those ten planes. Bring Hassfurth down here. I want to talk to him."

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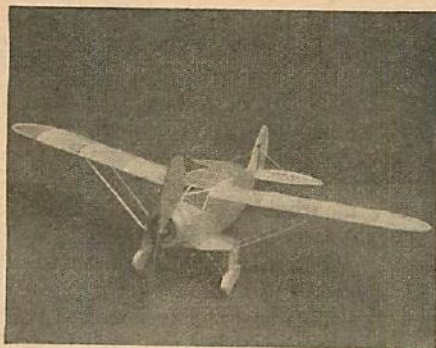
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Shorty was led into Temple's office a few minutes later. As he appeared Temple got to his feet. He joined Shorty and the guard beside him. The guard wore two automatics strapped around his waist. His face was scarred and battered, his nose flat and broken. He had slits for eyes and a chest and forehead like a gorilla.

"Come along with me," Temple said to him. "The boss wants you to know what this place is all about before he comes to talk to you. As I told you before, you want to be ready to talk sense. He has some rather persuasive methods of making people see sense who can't see it when he begins to talk to them."

Shorty walked along beside the man in silence. His eyes were taking in every detail of the place. He saw caverns off the runway that had been made into machine shops. One held an ambulance, another a fire engine and fast emergency crash truck. Two huge, stationary Diesels stood in one that was the power house. Workmen's quarters and airmen's barracks were built into others. One contained a swimming pool and showers and a gymnasium. The whole thing made up an underground city such as he could never have imagined.

At the end of the half-mile runway

the ceiling of the cavern had risen so high that it was only a vague shadow in the dim lights. Temple threw open a huge iron door and Shorty saw before him a miniature factory in which a hundred men toiled. They were fashioning things into various shapes with the aid of machines.

Shorty was fascinated by the appearance of an old man with a long white beard and myopic eyes who moved among them, directing their work. He was so old that his hands were gnarled and a hump had formed on his back between his shoulders. He did not hear or answer Temple's greeting, so intense was his concentration.

Temple threw open another door and a light switch. As the lights blazed on, Shorty saw that he was inside a cavern that stretched endlessly into space and darkness. The place sent chills creeping up his back it was so large and funereal and silent.

Shorty looked at Temple's face and saw that he too was frightened. He was looking at black shapes which were piled, tier on tier, along the walls. They were about the length, breadth and width of a man. Temple's face was white as he pointed at them. His hand shook a little.

"There," he said to Shorty, in a voice that broke, "you see the greatest thing

that has ever happened in the history of man."

"What are they?" Shorty asked.

"Men!" Temple said. "Men that can be brought to life."

"Men?" Shorty half whispered.

"Iron men!" Temple answered, his voice as low as Shorty's. "Thousands upon thousands of them are stored in here with a fleet of silenced planes that can be flown by those men!"

Shorty drew away from Temple and watched him closely. Was the man mad? Was he a lunatic who had gone crazy from using his own dope!

"I know what you're thinking," Temple said, quietly. "I'm not mad. That old man in there and Q-1 have the secret. These men can be made to come to life and operate, fly those planes. The planes are equipped with every means of destruction known to man. Fire, gas, germs, bombs. These men of iron and steel, without brains and without souls, will conquer the world under their direction. They can wipe all the human beings off the face of the earth if they want to. Or reduce them to the status of animals and serfs. The mechanical men will operate the planes by means of radio control. Nothing can stand before them."

"If they are destroyed they can be replaced with the natural resources of

the country. They can be turned out by the hundreds of thousands. Faster than nations can train human beings to fight. But human cannon fodder can become exhausted, exterminated. These men and their planes cannot be."

Shorty's battered face was a mask of horror as he gazed at Temple and realized that the man believed what he was saying. And perhaps it was true. Radio control of planes was not far away. Why not radio control of iron men—men to fly silenced planes by radio control?

The thing was weird and fantastic, almost beyond belief. The everyday man who lives his life in an office or in a shop or factory and his own home could not believe such a thing possible.

But Shorty could. He had lived his life, or the greater part of it, flying above the seven seas and all the continents. He had seen strange things and heard of stranger ones. Things that most people would not believe. Things that he knew to be true.

He believed Temple now. His thoughts darted in a thousand directions as he thought of the possibilities of such an invention in the hands of a peddler of dope! A man with the mind of a criminal, only a little removed from the rats who made up the gangsters of the world.

"The boss wanted me to show these things to you," Temple said. "He thinks he will be able to use you. He knows your ability. He needs men of your caliber—men with guts."

Shorty laughed. His laughter rolled out across the cavern and came echoing back with a strange, metallic quality added to it. He could feel ice water creeping up his spine and feel the hair along the base of his scalp rise.

"You won't laugh when he's through with you," Temple warned. "Take a look at that face. He's deaf and dumb." He pointed at the flat-faced guard. "He didn't used to be deaf and dumb. He laughed at the boss, too. Look at him now."

"I'm looking," Shorty said, grimly.

"It won't do you any good to fight him," Temple went on. "He'll break you like you'd snap a match in half. You might better be alive and sitting on the right side when the trouble begins. It's bound to come."

Shorty had been wondering while Temple had been talking if his wrists would stand the strain after having been bound so tightly for hours. He edged around so that Temple was between the guard and himself. He raised his right hand and pointed toward a pile of inanimate steel men. As Temple turned his head Shorty let his left fist go with all the weight and strength in his powerful body. It was a left hook combined with an uppercut. It landed flush on the point of Temple's chin. His jaw bone drove back that nerve

in the eardrum that causes temporary unconsciousness as Shorty's fist landed on it.

As Temple started to fall Shorty pushed him into the guard. As the guard started to catch him Shorty pulled one of the man's guns out of its holster. He clipped the man on the side of the head with the butt. He fell like a poled ox.

Stooping, Shorty went through their pockets with a rapidity that would have done credit to a Houdini. He took all the keys and papers he found and all the matches. Then he took the guard's other gun.

With a gun in each hand he started to run down the uneven floor of the cavern toward the dark end. He didn't know what was in front of him. But he did know what was behind.

He heard Temple shouting for help as he disappeared into the abysmal darkness of the huge cavern.

VI—A BRILLIANT MAN

BILL BARNES circled his own flying field twice before he risked setting the Scarlet Stormer down amidst the wreckage of his hangars and workshops.

He was in a cold fury as he looked upon the wanton destruction of his property. He was half sick as he kicked the Stormer into the wind and skimmed low over the electrically wired fence at the south end of the field.

The Stormer's wheels touched the concrete lightly and rolled almost up to the traffic-control tower before he set his brakes.

An ambulance came clanging across what was left of the apron with Dr. Humphrey riding on the rear step. It backed up beside the Scarlet Stormer. Bill, Dr. Humphrey and the driver of the ambulance lifted Bev Bates' inert form out of the cabin of the Stormer and onto the stretcher in the ambulance.

"Loss of blood and shock," the doctor said, after gazing at Bev keenly. "You said the bullet went all the way through his shoulder."

"All the way," Bill growled. "Clean as a whistle."

"That's good. I'll get him on the operating table immediately."

Bill swung away from the ambulance after he had told the doctor he would be over to the hospital as soon as he could get there. Scotty MacCloskey was standing by his side, his dour face more mournful than ever.

"Boy," he said, "they wrecked us. And we never heard them until they were on top of us."

"How bad is it, Scotty?" Bill asked.

"A half dozen old Shorters, one new one, a lot of machinery and the hangars," Scotty said. "It's plenty bad. Plenty."

"What about the transport?" Bill asked, breathlessly.

"Boy," Scotty said, "she's our one bit of luck. She's all right."

"That's something," Bill growled. "The rest is pretty much covered by insurance."

"The police commissioner is raving all over the place," Scotty said. "You'd better—"

"Mr. Barnes! Mr. Barnes!" a boy said beside him. Bill recognized him as one of the messengers from Tony Lamport's office.

"What is it, son?"

"Mr. Lamport says to tell you that Mr. Morton—James Morton—is calling from Washington. Wants to talk to you personally about something very important."

Bill stared at the boy for a moment as though he had not heard him. But he had heard. The name of James Morton had darted through his brain with the speed of lightning.

"There's the answer!" he said to Scotty MacCloskey and started to run toward the administration building.

He ran into his own office and grabbed the telephone. "O. K., Tony," he said into the mouthpiece. "Put him on. . . . Yes, this is Barnes, Morton. . . .

Yes. . . . When do you want me to come? I can get away almost any time. I knew this job was going to pop, but I didn't know from which direction it was coming. Some one else knew you were going to call on me, too. They've started to work on me already. One of my men has been badly wounded. They tried to gang me over Lake Ontario this afternoon."

Bill's eyes widened as he listened to James Morton, the chief of criminal investigation for the department of justice, in Washington.

"A dope ring, eh?" Bill said. "No idea who they are?"

Again he listened intently.

"They've picked up Hassfurther, too. At least he's missing. I sent him out to follow a man who threatened me. A man who told me this job was coming to me and tried to buy me off. Shorty hasn't reported back yet. . . . Don't worry, I'll be there. I'll be there by ten o'clock to-night—as soon as I know Bev Bates is out of danger and how much damage they did to my hangars and workshops. . . . Ten o'clock, Morton."

Bill slapped the receiver on its hook and sat back in his chair. A dope ring! One of the most insidious things on earth. The most powerful dope ring in the world, Morton had said. He thumped one fist into the palm of his hand in a characteristic gesture.

All right. They were looking for trouble. They had brought it to him. Now, he'd take it to them. He'd take it to them in his own little way and teach them to like it.

"All right, kid!" Bill shouted at Sandy Sanders at eight thirty that evening, and motioned toward the rear cockpit of the Stormer. He looked at the tachometer of the Stormer and turned to Scotty MacCloskey. "I'll keep in touch with Tony," he said. "The doctor says Bev is resting comfortably now. They have him doped up so that he'll sleep. Try and get that mess cleaned up and check over all the Snorters on the field and the transport bomber. Have Red and Cy Hawkins take the transport into the air and hook onto Sandy's Eaglet.

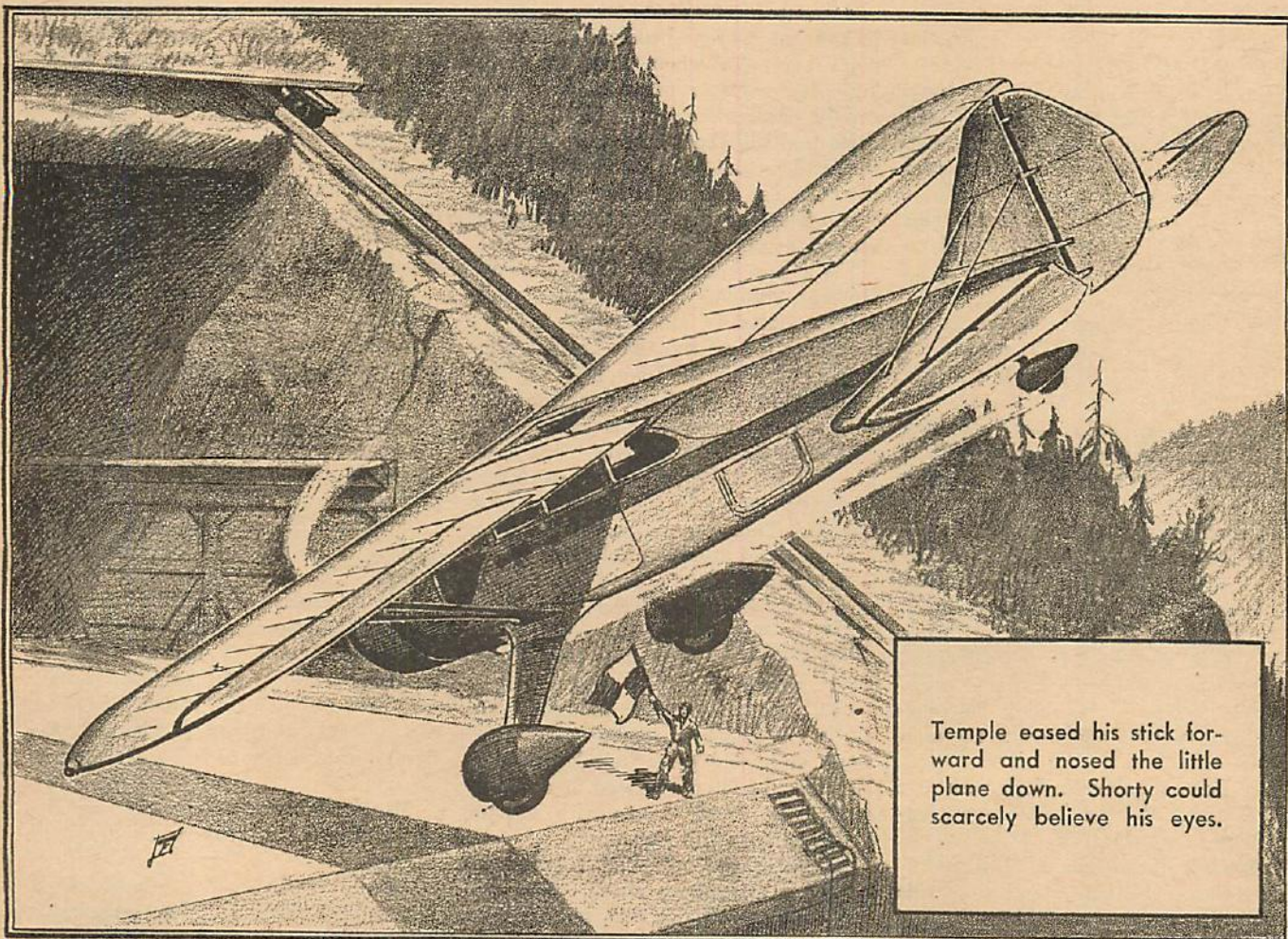
"You'd better unlimber your guns back there, kid," Bill said over the intercockpit phone to Sandy. "These birds who are on our trail seem to know more about where we're going than we do."

Bill checked his instruments and stuck the nose of the Stormer southwest toward the city of Washington. A brisk wind was clearing the sky of low clouds. A full moon lighted the rolling countryside, casting grotesque shadows across the hills. Sandy's head nodded and his eyes closed as the two supercharged Diesels sang their droning lullaby.

ing alone and they were waiting for me."

Sandy broke out the swivel gun and pushed back the sliding hatch. He ran the gun across its track as he sat astride the folding seat. He tried to train the gun on the twelve diving ships, but the speed of the Stormer was too great. Bill had jammed the stick forward with all his strength and the Stormer was diving as no plane had ever dived before.

Suddenly, Bill brought the Stormer over on its back in an inverted loop.



Temple eased his stick forward and nosed the little plane down. Shorty could scarcely believe his eyes.

Get it loaded aboard her. Have her ready. I may need her at any time.

"I'm going to leave Sandy in the Stormer in Washington so that Tony can reach us if any word comes in from Shorty. I talked to the police commissioner about Shorty. Don't let it get out that he's missing. Treat the newspaper boys nice, but don't tell 'em anything. They know something is about to crack. I'll contact Tony as soon as I've finished talking to Morton. That's all, I think."

"Keep your nose up, boy," old Scotty said.

Bill climbed into the pilot's seat of the Stormer and gunned the engines. A few minutes later the amphibian landing gear slid up into its belly as Bill stuck the nose into the night.

Bill was going over and over the things that had happened that day, turning them over and over in his mind.

Perhaps it was due to his complete concentration, but he did not see those two V formations of six planes each until they had dived out of a wisp of fleecy clouds a thousand feet overhead. He could not have heard them, for no sound betrayed them. He gasped, and shouted Sandy's name in the intercockpit phone as loudly as he could shout. White streams of tracers floated through the air as the twelve planes bore down on them.

"They beat us to it again, kid!" he said, half to himself and half to Sandy. "They cut in on Morton's telephone call in some way. Or they have a spy inside our place. They knew I was com-

He centered the controls and rolled right-side up as the twelve biplanes dove over him. Opening the throttle wide again, he stuck the nose up in an abrupt climbing turn until his motors nearly stalled. He kicked his rudder and rolled to the right. He was back on his original course again with the nose of the Stormer pointed toward Washington.

"That," he said to Sandy, grimly, "will be enough of that for to-day." He pushed the throttles of the Stormer wide open. The two three-bladed propellers dug into the night with all their power. The *tat-tat-tat* of a dozen machine guns joined the rising crescendo of his motors. The Scarlet Stormer became a dark-red streak in the dull light of the moon as it walked away

from the twelve pursuing planes as though they were anchored.

Just twenty minutes later Bill locked his wheel brakes on the apron at Bolling Field and dropped out of the cockpit of the Stormer. His face was like a thunderhead as he turned to speak to Sandy.

"Stick right here, kid," he said. "I'll take a taxi to Morton's office. And if any one bothers you, shoot 'em. Don't ask questions first. Shoot. Then ask 'em. You'll probably be hearing from Tony Lamport."

"O. K., Bill," Sandy said, grinning. "You look mad."

Bill didn't answer. He started across the apron to the place he knew he would find parked taxicabs.

When he walked into James Morton's office a half hour later he was still scowling. He wanted to hit some one. And he wouldn't have cared much who the person happened to be.

James Morton, a stockily built man with a square face, brown eyes and no hair on the top of his head, smiled as he shook Bill's hand.

"You look as though you wanted to take some one apart, Bill," he said.

"That's the idea," Bill said. "Who's backing this dope ring, Morton?"

"Before we go into that," Morton said, "I want to present you to Attorney General Waters, and Mr. Taggart Bone."

Bill shook hands with the tall, black-haired attorney general. When he gazed into the hard, cold eyes of Taggart Bone he got a momentary shock. He had heard of Bone a thousand times in the past, but had never met him. Yet, he had a feeling, a curious, unexplainable feeling as he shook his muscular hand that he had known the man before.

"Mr. Bone is going to work with you on this thing, Barnes," Attorney General Waters supplied.

"That is quite an honor," Bill said.

Bone flashed his white teeth in a wide smile. "The honor is mine, Barnes. I've watched your career with amazement and admiration."

"I've been fortunate," Bill said, flushing.

"Not fortunate," Bone said. "Capable. You've made your own breaks. I would dislike having you on my trail."

"That will hardly be likely," Bill said, as it seemed necessary for him to say something.

"I wouldn't be sure," Bone smiled. "You never know where your enemies will pop from."

Bill's gaze flicked across Taggart Bone's smiling countenance. What, he asked himself, is the man getting at? He doesn't have the reputation of a man who stands around making idle chatter. Where have I known him before?

"I'm going to leave you, gentlemen," the attorney general said, pompously.

"Mr. Morton will make you acquainted with the situation. He knows more about his end of our work than I do. But"—he shook a forefinger, solemnly—"I want you to realize that we are facing a very grave situation. Much more serious than it appears on the surface."

When Everett Waters had left them James Morton gave a brief outline of the activities of the dope and smuggling ring they were trying to wipe out.

"We've been watching all the known dope peddling promoters," Morton said. "But we can't get our finger into the real source of distribution. We've picked up a few peddlers, but they don't know for whom they are working. It's a clever organization, and a deadly one."

He told Bill about the transport plane that had set out from Cuba with twelve live Chinese aboard a few nights before. Then he told him the plane had arrived empty.

"Wholesale murder," Bill remarked. He was studying Taggart Bone while Morton talked. He couldn't get the idea out of his head that he had come in contact with the man before.

"Why don't you both have luncheon with me on my yacht to-morrow?" Taggart Bone asked, his white teeth flashing. "That will give each of us an opportunity to study the situation thoroughly. Then we can merge our ideas and work out a feasible solution."

"That sounds like a good idea to me," said James Morton. "What time?"

"One o'clock," Bone answered.

"You drop in here at twelve fifteen, Bill," Morton said.

"I'll have a launch alongside the yacht club dock at twelve forty-five," Bone said. He picked up his panama hat and put it on his head at a jaunty angle. He shook hands with Morton and then with Bill Barnes.

As Bill gazed into Bone's gray eyes he got a momentary shock. The man was smiling with his lips, but his eyes were mocking. As though he knew things that Bill didn't know and was amused at the idea.

"It will be a pleasure to have you as a guest aboard the *Priscilla*, Barnes," Bone said.

Bill didn't answer. He bowed slightly and smiled as he released Bone's hand. He stood studying the door after Bone had closed it behind him. James Morton watched him with an amused smile on his lips.

"What's on your mind, Bill?" he asked.

"Nothing," Bill said, slowly. "That is, nothing much. I can't get the idea out of my head that I've known Bone before. Under another name. But I can't remember where."

"Your imagination is playing tricks," Morton said. "His face is familiar because you've seen his picture in the

papers so many times. He's had a lot of publicity. Mystery-man stuff."

"He'd be a tough baby to crack," Bill said, thoughtfully.

"Why worry about him?" Morton asked. "You're supposed to work with him, not against him. He's a brilliant man."

"Yes," Bill said, thoughtfully, "I think he is."

VII—CONTACT

WHEN Bill walked into James Morton's office at twelve fifteen the next day his face was a thundercloud. He grunted as Morton greeted him and waved a hand toward young Sandy Sanders.

"I forgot to tell Bone it would be necessary for me to bring Sandy along," he said.

"He won't mind," Morton said. And to Sandy: "How's the Eaglet, kid?" His eyes and lips were smiling as he grasped Sandy's hand.

"She's still holding together," Sandy answered. "She gets better with age."

"Like yourself, eh?" Morton's brown eyes twinkled. "How old are you now, Sandy?"

"Seventeen, a couple of weeks ago," Sandy said, proudly. The freckles on his nose and cheeks stood out more prominently as his face reddened.

"What's the current hobby? Still writing your column for that newspaper?"

"Yes," Sandy answered. "But I'm getting awfully sick of it. It's hard to dig up material." He looked at Bill accusingly. "Bill won't let me use our own expeditions. He wouldn't have let me use the stuff about Maona and that flying pirate if you hadn't given me permission."

Morton laughed. "Haven't you any new interest to keep you busy?" he asked.

"No-o," Sandy said, cautiously, looking at Bill again. "I'm working on some experiments, but I don't dare mention them around Barnes Field because of Shorty and Red. If I open my mouth they begin to ride me."

"Any word about Hassfurth?" Morton asked Bill.

"Not a peep," Bill said, grimly. "I'm more than worried about him. Some one has him confined or—"

"Oh, forget it!" Sandy said. "No one can hurt that tough Pennsylvania Dutchman!"

Bill didn't answer. He knew that Sandy was trying to allay his fears. But that didn't help. He knew that Shorty was a prisoner—or dead. And he knew that being dead might be the more pleasant of the two.

"Get any bright ideas last night, or this morning?" Morton asked him.

"Not a one," Bill answered. "I don't have anything to work with. I can see

now that I should have followed those two blue planes that ran away yesterday. If I could have forced one of them down I might have got some information. But I didn't want to leave Bev Bates. I had word this morning that his shoulder is pretty much shot to pieces.

"This," he said, vehemently, "is a fine situation! Bates may be crippled for life. If poisoning sets in he may die. Shorty is missing. He may be dead now. My field is a wreck. It will cost a half million dollars to replace the planes and machines that were smashed. And we don't know who we're fighting!"

"You won't have to worry about your field if we dig up and smash this dope ring," Morton said, quietly. "And Shorty has been in tough places before and came through all right."

"You only get killed once," Bill pointed out. "Let's hop and see what Bone has to offer."

Taggart Bone sat in a deep, overstuffed leather chair before a two-way radio telephone, in the lounging saloon of the *Priscilla*. He had an ear phone clamped hard against his ear and his face was a thundercloud. His gray eyes were two evil slits. He was pounding on the table on which the midget transmitter and receiver stood and he was shouting so loudly into the microphone that he didn't hear a quartermaster knocking on the door. As he stopped shouting the knock was repeated. As he turned toward the door a startled expression flashed across his countenance. He lowered his voice and interrupted the person speaking to him.

"Signing off!" he said, and threw the switch.

Whirling in his chair he shouted, "Come in!"

A quartermaster opened the door and saluted smartly.

"Mr. Morton, Mr. Barnes and Mr. Sanders are aboard, sir," the quartermaster said.

"Show them in here, Marshall," Bone ordered. He studied the man's face to see if there was any indication that he had overheard his radio conversation. He was satisfied that the quartermaster had not, as he saluted again and turned away.

Bone was standing just inside the doorway as James Morton came through it followed by Bill and Sandy. His pleasant face was wreathed in smiles as he shook their hands and was introduced to Sandy.

"So, you're the youngster who flies the famous Eaglet, eh?" he said to Sandy.

"She flies herself, sir," Sandy informed him, flushing.

"Hardly that," Bone said. "I think I have a number of photographs here that will interest you. I've heard that you are quite an amateur photographer.

They are pictures I have taken all over the world."

"I'd like to see them," Sandy answered.

"It will keep you interested while we talk over our plans," Bone said, pointing to a row of albums in the built-in bookcases on either side of the fireplace.

"Would you mind showing us over the *Priscilla* before we begin our talk?" Bill asked.

"It would be a pleasure," Bone said. "I'm quite proud of her. I've touched almost every port in the world in her. She'll ride out any sea that is offered to her. What about you, Sanders?"

As Sandy nodded his head and started to lay down the album he had selected, Bill spoke.

"Sandy would rather look at pictures," Bill said. "He's a nut about them. He'll be polite and say that he would rather look over your yacht. But I know he would rather stay here."

Sandy's expression turned from one of amazement to smiling acquiescence as he caught Bill's eye. He didn't know what Bill was talking about. But he got the idea that Bill wanted him to stay right there in that room.

"Bill's right—if you don't mind," he said to Taggart Bone.

Bone's eyes were not smiling now. They were hard and they were glittering with a light that had not been in them when the men came into the lounge. He nodded his head and turned toward the door abruptly.

Sandy's eyes were on Bill as he turned to follow Bone. He knew that Bill could not speak without being heard by Bone and Morton. And he knew that Bill was trying to give him a message. Bill gave it just as he went out the door. He pointed at the radio transmitter and receiver and put one fist to his ear as though he were holding a telephone receiver. Sandy stared after him as the three of them started down the deck.

Sandy waited a matter of thirty seconds before he put the album down carefully and sauntered across the lounge to the table that held the radio. He saw that the receiving equipment consisted of the regular receiver and complete vacuum tubes, an antistatic-damped diaphragm head set and a dynamotor for power supply. It was compact and lightweight, and operated on two frequency bands. One from 190 to 450 kilocycles for department of commerce broadcasts and the other from 500 to 1,500 kilocycles. A flip of a switch changed it from one band to another and a calibrated dial made tuning simple.

The transmitting equipment was a compact unit employing only two tubes. It had crystal control and operated on two frequencies.

A million thoughts raced through Sandy's head as he studied the compact equipment. What had Bill meant? Did

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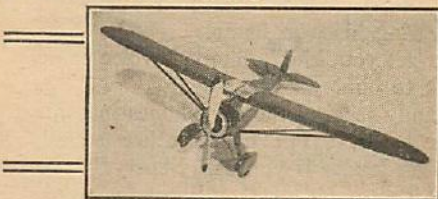
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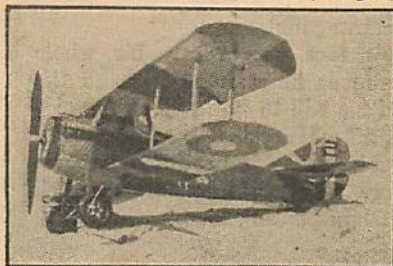
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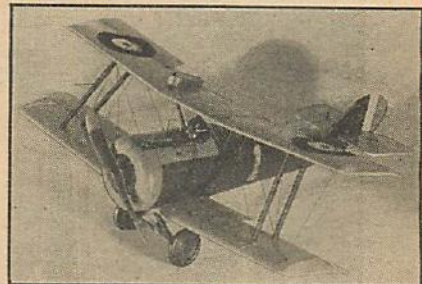


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he want him to try to get Barnes Field while they were away? If so, why?

He studied the transmitter and jotted down the frequency in kilocycles. Then he threw the switch to see if he could get Tony Lamport on Barnes Field on the national calling frequency.

"Calling B. B. X. . . . Calling B. B. X. . . ." he chanted a half dozen times.

Suddenly he clamped the ear phones tighter against his ears. Another voice was coming over the ether, a voice that was faint and indistinct. And that voice was also chanting the call letters B. B. X.!

Sandy's whole body tensed as the voice became stronger. He held his breath as his eyes grew round. He could not believe his ears. The voice coming over the radio was the voice of Shorty Hassfurth!

He shouted into the microphone, calling Shorty's name over and over, and repeating his own name.

"I get you, kid!" Shorty's voice came back to him. "Listen!"

Sandy pressed the ear phones into his ears to shut out every other sound. "Speak louder if you can, Shorty."

"Listen, kid—" Shorty's voice came back, then stopped! Just those two words, far away and indistinct. Then silence, after the last word was sucked out of Shorty's mouth as though he were strangling!

Sandy's face was white, his whole body tense as he strained with all the power of his will to bring Shorty's voice back again. He called his name over and over again, frantically. His own voice rose to a shrill, unnatural pitch that left him panting for breath.

Suddenly, he realized that he must get hold of himself. His hands were shaking as he wiped the perspiration off his face. His first impulse was to rush out and find Bill. Then he thought better of it. Something warned him that Bill would not want Taggart Bone to know that he had heard Shorty's voice over his radio telephone. Otherwise he would have asked to use the radio and would have done it before Bone.

Sandy knew Bill's methods well enough to know that he had lured Bone away from the radio while he, Sandy, had an opportunity to use it. He called Tony Lamport's call letters again. In a moment Tony's voice came back to him.

"This is Sandy speaking, Tony," he said quickly. "Get this! I am aboard a yacht with Bill. I just tuned in the radio to get you and heard Shorty's voice trying to do the same thing. Have you heard from him?"

"Not a peep, kid. Where is he? What did he say?"

"Nothing. He just recognized my voice when he was cut off. His voice died as though he were choking. Listen now! I've got to talk fast. We'll call you back later and explain. Check up and see who is assigned a daytime frequency of 5183 kilocycles. Find out what their night frequency is if they are listed by the government. Do you get it?"

"I've got it, kid. How soon will you call me back?"

"In a couple of hours. Signing off!"

Sandy snapped the switch and dove to a position squatting in front of the bookcases as Taggart Bone, Morton and Bill Barnes came back into the room.

Taggart Bone's face was as hard as Vermont granite when he crossed the room and glanced at the radio frequency dials. Something like relief was plainly evident on his features as he whirled the dials and said a few bantering words to Sandy about photography.

Bill Barnes smiled as he saw the coolness and poise with which Sandy answered him. He could tell the kid was burning up inside. But he was hiding it like a veteran. Bill hoped he would be able to contain himself through luncheon.

His fears were allayed when Taggart Bone led the way to the dining saloon and Bill saw the luncheon the *Priscilla's* steward had prepared for them.

Sandy's eyes grew round as he took his first taste of diamond-back terrapin stew. He forgot everything but the food before him. Food such as he had never tasted before. Food that would have made the most critical gourmet forget everything else.

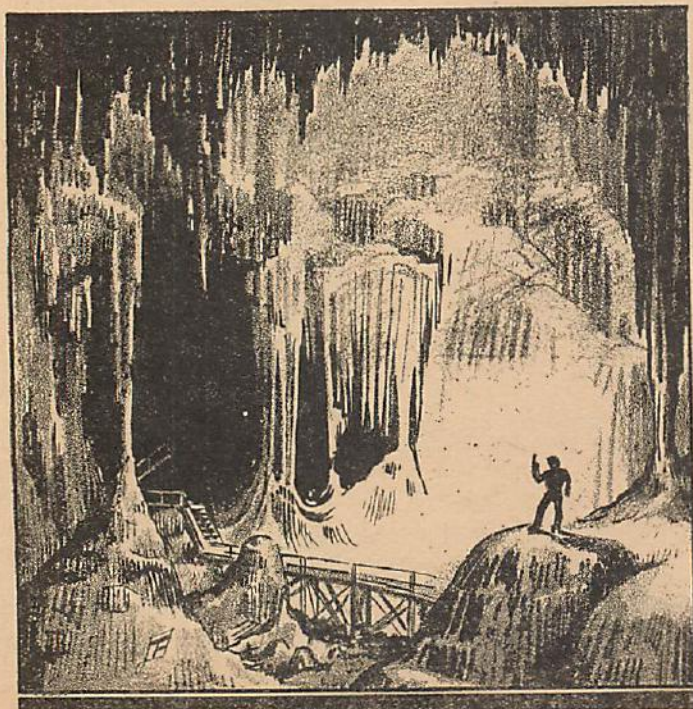
Bill grinned as he saw that Sandy was refusing nothing. Next to flying the Eaglet, food was Sandy's greatest passion. Shorty Hassfurth had told him time and again that if Sandy was ever knocked unconscious in a crack-up he would stick a lemon meringue pie under his nose instead of the proverbial smelling salts. That would bring him around. He would sit up and open his eyes and mouth. And Sandy had never denied it.

After Bill had acknowledged the excellence of the terrapin stew his bronzed face became serious. He asked Taggart Bone whether he had evolved any plan to locate the men behind the dope and alien smuggling.

"It won't do us any good to pick up a few of the actual smugglers," Bill said. "We want to get the men who are directing the dope ring. The higher-ups."

"I think you're wrong there," Taggart Bone said, quietly. "I've had men working for the past couple of days. Men that know their business. One of them is a high government official in Cuba. He fought with me in a half dozen South American wars. He informs me that no one knows who the power is behind the throne. He says, the higher-ups—as you call them—are unknown to the men working for them. It is an intricate network where no one knows who is the man directly above the man above him. A man who tells a subordinate who directs him is certain to be found with a slit throat within twelve hours. There is an espionage system constantly at work within the main system. No one dares talk.

"Therefore, we've got to start at the bottom. The man at the bottom knows the man who is directly above him. That is all. But if we start at the bottom and keep working up we'll eventually get to the master mind. I say master mind advisedly. Torres, my Cuban



Shorty was afraid! The great cavern was still, silent, terrible.

adviser, tells me the man is undoubtedly an arch-criminal—a genius in crime."

Bill shifted impatiently in his chair as Bone stopped talking. Why, he asked himself, is the man stalling? He, Bill, had learned that the way to break up a criminal band was to get to the brains, the director, as fast as possible. When you had him it was like pulling the foundation out from under a house. The house collapsed. If you started from the top and took the shingles off first the director would be warned and on his way before you got to the foundation.

"There ought to be some way to——"

Taggart Bone put up a hand to stop Bill. The way he did it annoyed Bill. He decided that he didn't like Taggart Bone. There was something about the man he distrusted.

"I have certain information that will be of value to us," Bone interrupted. "It will give us a chance to slip in our entering wedge."

"Good!" Morton said. "Let's hear it. Let's get going!" He, too, was annoyed by Bone's dilatory way of approaching a beginning. Like Bill, he was a man who believed in action and results.

"I have been informed——" Bone smiled in a superior way, and stopped talking while he lifted a forkful of food to his mouth. "I should explain that I have means and methods of getting information that is not available to either a government agent or a free-lance, like yourself, Barnes. Men who are engaged in my kind of business come in contact with all types of men. Adventurers, criminals, confidence men, politicians. They all have information that is valuable to some one at one time or another. I get my information from my world-wide interests through such channels. A war lord in China will be of value at one time. A politician in Cuba at another. I keep them available so that I can get my information from men who know what they are talking about."

Bone stopped talking again while he lighted a cigarette. He studied the burning end for a moment, then resumed:

"I am told that there is a big movement of aliens and dope under way in Cuba. Six planes and six fast express cruisers will be used to transport the contraband. The cruisers will be loaded and will leave the waters of Cuba quite openly. But before they actually leave, the aliens and dope will be taken off them and secretly transferred to the planes.

"The idea behind this movement is to get us to follow the cruisers across to the Florida Keys. While we are doing that the planes with the contraband aboard will land on the west coast, above St. Petersburg and transfer their cargo to fast automobiles. They will land unobserved while we concentrate

on the cruisers entering the Keys. When we capture the cruisers we will find them empty and with their papers in order.

"What we must do is obvious. We must disregard the cruisers and concentrate on the planes. That will be your job, Barnes."

"You're sure of this?" Morton asked.

"Positive!" Bone said. "I will be informed what night they will actually leave. And when. And where they will land. That is all we have to know. The rest will be easy. We'll have a dozen men in our hands that can tell us who is immediately above them. From whom they take their orders. After we set a trap for them we'll be able to go a step higher in the ring."

"What makes you think they'll talk?" Bill asked.

"They'll talk all right," Bone said grimly. "I learned in China how to make men talk. It isn't a pleasant thing to watch, but it's effective."

"I'll send for more of my men," Bill said.

"You'll need them," Bone said. "You had better send for all of them. It's too bad Hassfurth won't be with them. He is a good man."

Bill's whole body stiffened as though a bolt of electricity had been suddenly driven through it. He could feel the blood pounding at his temples as he gripped the edges of his chair to keep his hands still. He knew his face was growing crimson. He lifted a glass of water to his lips quickly to hide his sudden consternation. While he drank he flashed back over the conversation he had had with Bone the previous night. And while he had been aboard the *Priscilla*. He knew he mustn't make a mistake. He knew this was one of the times when he must tread easy. He put his glass back on the table with a steady hand. He gazed into Taggart Bone's steel-gray eyes with eyes that were expressionless and as hard as Bone's.

"How do you know Hassfurth won't be with them?" he asked, quietly.

Young Sandy's eyes were popping with excitement now. Thoughts rushed through his mind like the cars of a speeding express train. What did this have to do with hearing Shorty's voice over Bone's radio? He knew that at this particular moment Bill Barnes was a dangerous and deadly man. He knew that when Bill's eyes glittered the way they were glittering now that anything might happen. He had heard Bill speak in that same quiet, intense way before.

And the next moment hell broke loose. He saw Bone's face redden slightly and saw that momentary blinking of his eyes—the way a man will blink when he has been struck an unexpected blow. Then he saw Bone smiling again, smiling that cool, almost theatrical smile. And he knew that Bone was as danger-

ous and deadly as Bill Barnes now. He held his breath while he waited for Bone to answer.

"You told me," Bone said, as quietly as Bill had spoken. "You mentioned in Morton's office last night that he had disappeared after you sent him on some assignment."

"I had forgotten," Bill said, after a moment in which their eyes clashed. "I had forgotten about telling you." He shook his head angrily. Then he looked at Bone again. "Do you mind if I ask you a personal question, Bone?"

"Not at all," Bone smiled. "As long as you don't ask me how many men I've killed." He was smiling, but his smile was deadly. And his eyes were like the eyes of a striking rattler.

"Have you ever done any of your—ah—business in Borneo?" Bill asked. "I had a job out there one time. The job had to do with the disappearance of Hassfurth. It was immediately after I won the round-the-world race in the *Scarlet Stormer*. A couple of years ago. Do you remember whether you were out there at that time?"

Bone held his pursed lips between his fingers while he studied the table. After a moment he raised his head and looked at Bill evenly.

"Yes," he said. "I've been there. I've had interests there. But I wasn't there at that time. I recall that round-the-world race. I think every one followed it. The whole world stood still while you were circling it."

"I see," Bill said.

"Why do you ask?"

"Curiosity," Bill said. "I told Morton yesterday I thought I had known you before. It came to me a moment ago that perhaps that was the time."

"I'm afraid not, Barnes," Bone laughed. "You'll have to try again."

"I will," Bill said. He pushed his chair back from the table as Bone got to his feet.

VIII—PIT OF HORROR

SHORTY cursed long and earnestly as his head came in contact with a piece of jutting limestone. His fingers came away from the spot covered with something that was warm and sticky. His head whirled as he leaned against a wall of solid rock. Panic gripped him as it had never gripped him before. He fumbled in his pockets with trembling hands for the flashlight he had taken from the flat-faced guard. He had dashed madly ahead in the absolute darkness until no light showed behind him. Once his foot had slipped off solid ground. He wavered on the edge of an abyss that he could not see, fighting desperately, clawing, gasping.

Now he was afraid to take another step. The darkness was so intense that it pressed down on him like a physical thing. He wanted to shout for help, to

hear a sound, any sound. The place was as still as a tomb. And cold. Not a breeze fanned his face. The great cavern was still and silent, and terrible.

He pressed the button on the flashlight and a streak of light leaped out before him. His eyes grew round with wonder at the vast cavern. Massive formations of myriad shapes and countless colors blended into a supernatural whole. A great cascade of translucent stone, studded with a million jewels, seemed to flow from the wall of rock to his right. Farther to the right a giant stalagmite leaned far to the left. Mosques and domes and minarets reared their shapes toward the vaulted ceilings.

For a few minutes he forgot the death that awaited him at the mouth of the great caverns. He forgot Temple, his captor, the blue biplanes, the mechanical men piled tier on tier, waiting to be brought to life. He forgot everything but the wonders of the stalactite and stalagmite formations around him.

He knew they had been formed from the percolation of water carrying carbonaceous acids through the crevices in the calcium carbonate or limestone strata overhead. He knew the coloring in the formations came from pigments of iron, magnesium and other minerals through which the water seeped. But he did not know, nor did any one else know, how many centuries, how many thousands of years it had taken them to form.

He could only stare at them with unbelieving eyes. He could not believe what he actually saw. He was like a small boy in a dream. A small boy gazing off into endless space and surrounded by horrible monsters.

He gripped the smooth, brown surface of a pilaster with one hand while he played the flashlight around him with the other. It was a grotesque grotto such as only a madman might imagine.

Off to his left a huge piece of limestone had fallen from the ceiling above to form a bridge over what appeared to be a bottomless abyss. He made his way toward it as he heard faint sounds coming from the distance. He knew he must keep on going farther and farther into the bowels of the earth. His only hope for escape was to find a crevice through which he could squeeze to the outside world. If such an opening showed itself. He knew that men were constantly finding holes in the earth that led into these limitless caverns. To go back would be sure death.

He crossed the limestone slab on his hands and knees. It was barely two feet wide in spots. He dropped a piece of dirt off into space. He could not hear it strike. At the head of the piece of limestone he came to a crevice that led into a corridor lined on each side with solid limestone. He played his flashlight along it, but could not see the end.

As he started forward again he heard the shouts of men behind him. That would be a searching party out to find him. He checked the ammunition in the two guns he had taken from the guard. They were both fully loaded. He decided that he would not be taken alive again. He knew the kind of torture men like his captors could and would offer him. Men who would peddle dope would have no scruples. He was on his own as he had never been on his own before. Death in the air was nothing to the nameless terror that surrounded him.

He measured the path twenty feet in front of him with his light, then turned it off. He knew he must conserve the juice in its batteries. When he flashed it on again he saw a small pool of water that had formed in the hollow of a huge stone. He dropped on his hands and knees and drank his fill, then splashed his face and head with what remained. The voices and shouts behind him were becoming clearer now. He hurried along on the soft, clay floor. Suddenly the crevice became so narrow he could just move along it. Then it curved to the left and widened out again. As it swung to the left again he knew he was going back in the same direction from which he had come.

The voices sounded almost on top of him now. Yet he could not see lights. He shaded his own light with his hands, leaving just enough light to see a step ahead.

Suddenly a light played on the wall of the corridor ahead of him. The ray came from a crevice in the rock formation to his left. He advanced cautiously toward it. When it had disappeared he stuck his head around the corner. Below him, moving slowly along the floor of the great cavern were a hundred men. They were playing lights along the walls, behind every rock, into every crevice. Temple was shouting orders at them, cursing them. They were all armed. Their faces were savage and brutal. They were like a pack of hounds on the scent. All wanting to be in at the kill.

Shorty shivered and drew back. The place where he stood was like a balcony running around the wall of the huge grotto. They could not see him from below except where the rock formation was broken.

He deliberated for a moment as to whether he had better turn back and try to get farther away from the mouth of the cavern or go toward it.

A mad idea flashed through his mind. Could he, while those hundred men were searching for him, get back to the mouth and get a plane into the air? It was a million-to-one shot. But the only chance he could think of. He would have to get a plane warmed up. And he would have to get the opening to the cavern swung open.

He decided that the mouth of the

cavern and hangars would be the safest place for him. There he would be one man among a thousand. He might lose himself among them until he had a chance to break away. Out here they might turn poison gas loose. He decided his best chance for life lay ahead.

After he had gone forward for a matter of nearly an hour he became aware that the floor of the crevice was sloping downward. He was sure that he had gone at least a mile from the time he had seen his pursuers below him. Indistinct noises were becoming audible now. He could not put them together or separate them one from another. But he was conscious of them. He went forward more slowly, keeping his light aimed at the ground.

Suddenly the corridor made an abrupt turn to the left. It was like a hallway in a large hotel now, with occasional fissures and breaks taking the place of doors. Far ahead he saw a dim, artificial light. He turned off his own light and proceeded slowly toward it.

He became aware of a curious noise now. A noise that caused his scalp to tingle and ice water to creep up his spine. It was a constant babble of voices, rising and falling. Sometimes one voice would rise high and shrill above the others. He could not see men, could not be sure. But he was sure the babble he heard was the voices of men.

He saw that the light ahead of him was becoming larger and brighter. He saw that it was a steel-barred window in an enormous room of solid stone. A room whose perpendicular walls rose to a height of fifty or sixty feet toward the vaulted ceiling. Around it ran a stone corridor such as the one he was in. Men patrolled along this corridor with automatics strapped to their waists. Evil-looking men who now and then fired a shot into the bedlam that came from the floor of the pit below.

Shorty's hair was rising at the base of his scalp as he crept forward on hands and knees to the barred window. What he saw as he gazed down into the pit caused him to draw in his breath with a noise that was half a sob and half a groan.

Along one side, in a glass-enclosed room, fitted with a hundred instruments, was the old man with the long, white beard and myopic eyes who had been directing the work in the miniature factory. The old man was working levers and pressing buttons on a board in front of him and making remarks to assistants who were jotting them down with pencil and paper. He would point with his gnarled fingers at one of the objects in the bottom of the pit, then press a button. The object in the pit would go through certain motions which one of the assistants would record.

Shorty realized what the objects were. He realized it with a feeling of horror that caused the skin on his body

to creep. They were working models of the mechanical men Temple had pointed out to him. There were twenty or thirty of them in the pit. They were grotesque, weird objects with arms and legs that were straight and unjointed. Their torsos were oblong blocks of steel. The things that sat on their shoulders were round glistening balls that were death heads. Their hands and feet were shaped like the hands and feet of a man and were delicately fashioned.

There were no wires attached to them. They moved about the pit like automations, directed by the hand of the humpbacked old man in the nonshatterable glass cage.

And then Shorty became aware of something else!

He became aware that along with the mechanical men in the pit there were real men. Men of flesh and blood. They were crazed with fright and half mad with terror. But he could not mistake even those pitiful specimens of human beings for mechanical men. He saw that the madman in the glass cage was trying to accustom the mechanical men to the actions and motions of living men! That would mean that he had tried to install certain senses in the mechanical men. He might even have tried to build a brain for them before he brought them to life!

He saw the old man point to two of the mechanical men, saw him press a button and throw a switch of some kind. The two mechanical men advanced toward a human being who was cowering in a corner. They came to a halt before the jibbering thing that was human. Then their steel bodies bent at the waist. Their steel hands grasped the clawing man's body as a giant would grasp a child. The man's body came apart in their hands as the same giant would tear a child limb from limb!

Shorty did not watch the pit any longer. He buried his face in his hands. His whole body screamed with protest at the fiendish, supernatural things he had seen. At the horror of them. He wanted to tear the old man apart with his own hands.

He knew now what Temple and his bloodhounds would do with him if they found him. He took one of his guns out of his pocket and carried it in his right hand and the torch in his left as he crept away from the barred window. He moved down the corridor that surrounded the pit, on his hands and knees. He saw one of the armed guards rounding a corner ahead of him. He pressed his body back into a crevice so that he could not be seen. He waited, hardly breathing, until the guard was opposite him.

The guard dropped without a sound as Shorty's gun caught him below and behind his ear. He grabbed the man and dragged him back into the crevice. In five minutes he had stripped him of

his clothes, tied his hands and feet and used his own clothes to gag him.

Then he put on the guard's clothes and stepped out into the corridor. He pulled the black workman's cap the guard had been wearing well down over his eyes. He left the brass button with the guard's number on it on his shirt. He sauntered down the corridor as though he had been a guard there for most of his life. He did not look down in the pit as he moved along above it. He was afraid to trust himself. He was afraid of what he might do.

And he knew now what he had to do. He must get word to the outside world as to what was happening in this weird cavern of mad men. He must get outside himself. Or he must find some way to warn the world.

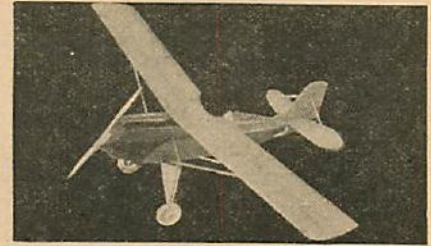
He remembered the radiophone Temple had used in the plane that brought him to the cavern. If he could get to that he might be able to get Bill or Tony Lamport on the air. That, he decided, was his one chance. He opened a steel door and walked down a flight of steps on the far side of the pit. He had been careful to keep the other guards on the far side of the pit from him.

At the bottom of the stone stairs he came to another steel door. He unlocked that and pushed it open. His shoulders were hunched a little forward and his right hand was ready to go for the gun that hung in its holster on his hip.

But no one blocked his way as he stepped out into the huge cavern where he had first landed with Temple. He stood there for a moment looking about him. He knew it would be better if he kept walking. The great doors at the end of the hangars were closed. He saw the mechanical contrivance such as are used on airplane carriers at sea and understood how Temple's plane had been brought to such a sudden halt as they landed. Near the doors he saw a catapult.

He hunched his shoulders and moved in the opposite direction as a man came toward him. He saw a row of what he took to be offices. He stepped inside a door that led to a hallway. There were a half dozen beautifully appointed offices on his right. Men were sitting at desks engrossed in their work. They paid no attention to him. He moved down the hallway and opened a door at the end. It was a small room filled with different kinds of office equipment. Closing the door, he turned on a light. Then turned it off quickly. Through a window at the back came the peculiar blue-white light of a radio room. He knew he was close to what he had been trying to find. His fingers were trembling as he leaned on the window sill and gazed across into the radio room. There were three operators inside, and an armed guard.

Shorty had no idea how long he sat



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inside that room waiting for an opportunity to get into the radio room. A time when there would be only one operator on duty and no guard. He didn't know whether it was daytime or night. His wrist watch had been broken. It still ticked but the crystal and hands were gone.

Time seemed to mean nothing to the men working in the caverns. He opened the door occasionally to glance out at the men working in the hangar. One shift relieved another. Work kept on continuously.

He had time to think of those mechanical men while he sat there. A picture of the two robots tearing a man's body apart flashed before his vision a hundred times. He shuddered at the havoc such an army of men could bring about. An army of steel men with no consciences, and directed by madmen. They could not be destroyed by human beings. They would have to be torn apart or the spark of life destroyed before they could be stopped from razing civilization. Directing radio-controlled silent planes they would be invincible. Nothing could stop them but direct hits that would demolish both plane and robot. The pictures he built up in his mind left him sick and shaking.

He sat with his eyes glued to the radio room, saw men come and men go on what he judged to be two-hour shifts. He didn't dare close his eyes. His head nodded but he fought himself back to consciousness.

Then he saw two of the regular radio men leave the room with the men from the previous shift. That left one man and the ever-present guard. He waited until their footsteps had died in the hallway. Then he opened the door, softly. Men were working in the offices. He slid out the door and through the door to the left, opening it as noiselessly as possible.

But the guard was on his feet as Shorty stepped into the room. He was on his feet and had his hand on the butt of his gun. When he saw the brass button with the guard's number on it and the black workman's cap, such as he himself wore, he relaxed his vigilance and started to sit down again. The radio man twirled dials and threw switches, paying no attention to him.

Shorty smiled at the guard and opened his mouth to speak. As the guard was nearly in his chair and bending forward Shorty's right fist caught him square on the point of his chin. He slumped forward on his face the way a man slumps when he is completely out.

Shorty waved his automatic at the radio man as he whirled around.

"Get me a national calling frequency," he barked, "and give me those ear phones!"

The guard opened his mouth to protest. He gagged and choked as Shorty

jabbed the automatic into his solar plexus.

"Hurry up, guy!" Shorty snarled.

The radio man threw a switch and tuned for a moment, then nodded his head. Shorty leaned forward and began to call Barnes Field.

It was then that he was conscious that Sandy's voice was coming over the air to him. He took a quick look at the still unconscious guard and the radio operator and said, "I get you, kid! Listen!"

"Speak louder if you can, Shorty," Sandy's voice came back.

"Listen, kid," Shorty said. He was trembling like a colt at the barrier now. His whole body was damp with perspiration.

Then something fastened itself around his throat. Something with the strength of ten men. He tried to turn his head, to tear the fingers loose that cut off his wind. He could not move. He was held as though he had been placed in a vise.

The thought of those two robots tearing a man's body to pieces raced through his reeling brain. His tongue was coming out of his mouth and his eyes were bulging. He made one last terrific effort. Then everything went black and he lost consciousness.

IX—TO MEET DEATH

BILL, James Morton, and young Sandy climbed up the gangway from the *Priscilla's* launch and got into the wide seat of Morton's roadster. As soon as they were seated and away from the ears of the launch's crew, Bill barked at Sandy, "All right, kid. Shoot!"

Sandy disregarded Morton's look of amazement. His voice was quivering with excitement as he spoke.

"We want to get to Bolling Field and the Stormer as fast as we can get there, Bill!" he said.

"Bolling Field!" Bill said to James Morton. Morton stepped on the starter and threw the car in gear. That was one thing Bill liked about Morton. He didn't ask a lot of useless questions.

"I tuned in on Bone's radio and got Shorty," Sandy said, breathlessly. "I got—"

"Did you write down the sending frequency on Bone's transmitter?" Bill snapped.

Sandy gave him a dirty look. "Certainly!" he said. "I'll come to that in a minute. I was trying to get Tony at the field when another voice cut in trying to get Tony. I didn't recognize it at first. Then when it came a little clearer I knew it was Shorty! I told him to speak louder, that I was just getting him. He said, 'I get you, kid! Listen, kid!'"

"Then his voice died away. He made a sound like pulling a shoe out of soft mud, when it's in up to the ankle. He

sounded as though he was being strangled. I tried to get him back. But that was the last I heard. I—"

"Did you try the frequency Bone left on the transmitter?" Bill asked sharply.

Sandy stared at him for a moment. Then snapped his fingers in disgust. "That never occurred to me, Bill," he said.

"What did you do next?" Bill asked.

"I got Tony and gave him Bone's frequency and asked him to find out who was assigned a frequency of 5183 kilocycles. He has probably checked it by now."

"He won't find any assignment for that frequency," Bill said.

"Why do you think that, Barnes?" Morton asked. "What has Bone to do with all this? Why did you ask him about Borneo. And about Hassfurther?"

Bill didn't answer for a moment. His mouth became a thin, straight line across his face. His forehead was wrinkled in a determined frown. Finally, he answered.

"I'm darned if I can explain that, Morton," he said.

"You mean you don't want to?"

"No. I mean I can't. I was playing a hunch. Perhaps I was a fool. I saw Bone's two-way radio outfit as soon as I entered the room. That's why I asked him to show us over his yacht. And why I stalled when he wanted to take Sandy along. I wanted Sandy to get the frequency over which he had been transmitting. It isn't strange to find a two-way radio on a yacht. But it is strange to find one in the lounging saloon. He has a complete radio room with every kind of equipment aboard. I was curious about the one he used personally.

"I can't exactly explain why I was curious. It sounds strange when I tell you about it. But I have a peculiar hunch about that bird, Bone. I think Shorty could clear it up if I could find him. I think Bone was mixed up with Otto Yahr when the Eurasian captured Shorty during my round-the-world flight."

"You're crazy, Barnes," Morton said. "Bone is held in the highest esteem by countless high officials in Washington. He's a man of impeccable reputation."

"What does he do?" Bill asked. "Just what are these far-flung interests of his? Why does he spend most of his time wandering around the world on his yacht?"

"Many wealthy men do the same thing," Morton protested. "You're screwy, Bill."

"O. K.," Bill said grimly. "We'll see. I'm not certain. But I am almost certain that I did not mention Shorty's disappearance last night before Bone. I told my men at Barnes Field to keep quiet about Shorty and not give anything out to the newspapers. The only person outside my own outfit who knows

he is gone is the New York police commissioner and the men who are holding him a captive. I'm sure the men we are after have Shorty some place. He probably managed to get to a transmitter. And I have another hunch. I think the place Shorty was sending from was the place Bone was talking to. Take that or leave it. I can't prove it now. But I will before I get through."

"Don't get sore, guy," Morton said, grinning. "I must admit I'd be willing to play your hunches most of the time."

He swung his long, low roadster through the gates of Bolling Field and came to a stop near the hangar that contained the Scarlet Stormer. A couple of minutes later Bill made contact with Tony Lamport.

Tony said: "Five-one-eight-three kilo-

days ago. But there isn't anything we can do about that without using code. Let me talk to Scotty MacCloskey. And don't wander away from your sets today. Keep your men on them constantly. Have 'em cover every frequency they can get and take down any conversations that are in code or sound as though we might have anything to do with it. Get that, Tony?"

"I get it."

"Right. Hello, Scotty."

"Yes, boy," Scotty MacCloskey's bur came back to him.

"How is Bev coming on?"

"Not so good, Bill. But there's no danger of poisoning now. A lot of pain."

Bill clenched his fists. "Check over Red's Snorter and the carrier-transport

surface of the indigo bay as he cut his engines. Immediately after him the gigantic carrier-transport lumbered to a graceful landing and pulled up beside him. Red Gleason fishtailed his gleaming Snorter in on the other side of the transport.

Twenty minutes later the three ships were riding their sea anchors. The sun, a flaming ball of red, was sinking into its bed in the west as a fast speed boat put out from the water front and headed toward them. Bill turned and spoke to James Morton, who was riding in the rear cockpit of the Stormer.

"I'll leave men aboard the transport to pick up any messages from Bone or Tony Lamport," he said. "We'll get a good night's sleep at a hotel."

"Bone said he expected the movement of dope and aliens from Havana tonight," Morton warned.

"We can get back aboard within twenty or thirty minutes," Bill said. "For some reason I think Bone sent us down here to get us out of the way. I don't trust that man, Morton."

"You've mentioned that before," Morton said dryly. "We'll never get any place if we don't work together."

"I——" Bill stopped as a light gleamed red on his radio panel. He threw the key and spoke into the microphone.

"B. B. speaking," he said. "B. B. speaking."

"This is Taggart Bone, Barnes," a voice said into his ear phone. "I just had word from Torres that six planes and six express cruisers will leave Havana about ten o'clock to-night. Follow my previous instructions. Never mind the cruisers. They will have nothing aboard of any interest to us. I have ordered coast guard cutters from the base at Fort Lauderdale to cover them. The planes will cut northwest into the Gulf of Mexico. Then back, northeast to make a landing near Cedar Keys. You had better pick up the planes as soon as they leave Havana and keep them in sight until they make a landing. Don't molest them until they actually make their landing. When they try to get the stuff ashore, get 'em. Is that clear?"

"That's clear," Bill answered sharply. "It's going to be a moonlight night. I thought they usually operated on dark nights."

"Not always, evidently," Bone said. "The moon ought to help you."

"I won't need any help," Bill said, shortly. "We'll pick 'em up."

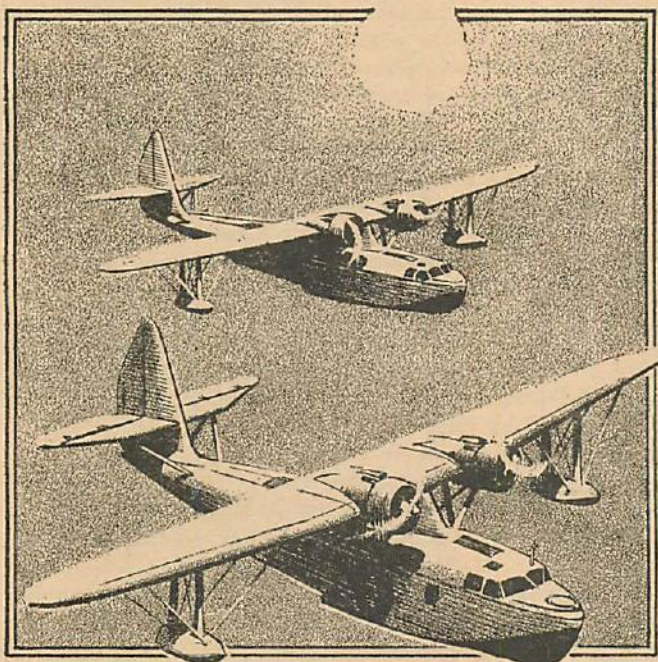
"I'll stand by for your report," Bone answered. "Signing off."

"Signing off," Bill answered.

He made contact with Red Gleason and Cy Hawkins as the speed boat came alongside.

"We're not going ashore," he shouted at the man at the wheel. "Tell the skipper of the coast guard planes to be ready

The smuggler transports showed clearly in the moonlight, with no attempt at concealment. It didn't make sense.



cycles isn't listed, Bill. There is no assignment for that frequency. I've checked and double-checked it."

"You didn't try to get it on your outfit, did you?" Bill asked quickly.

"No," Tony said, "I didn't. I had a hunch you might not want me to."

"We're good on our hunches to-day, Tony," Bill said. "Leave it alone. If they know we know the frequency they'll change it. There is no way to locate a station using that frequency, is there?"

"None that I know of," Tony answered. "It's like hunting for a needle in a haystack."

"Well, keep tuned in on that frequency and pick up anything you can get," Bill ordered. "Code or anything else. I'm afraid they'll suspect we have it and use code or change the frequency for their own communications. Keep listening in on anything from five to six thousand kilocycles. They are probably listening in on us now. They had our frequency over Lake Ontario two

carefully," he ordered. "Full equipment and all the ammunition they'll carry. Put Cy in the transport, McCoy and Neely in the wing cockpits, Charlie in the tail, Miles on the Eaglet gear and retractable machine-gun cockpit, and Martin in the nose. Sandy will join Cy when they get here to handle the one-pounder and the Eaglet. Get Red and Cy away as soon as you can. I'll leave Sandy in the Stormer to take your report when they leave there. Tell Tony to pick us up if he hears anything from Shorty—or about him. Tell Cy and Red to keep their eyes open on the way down here. A dozen of those blue ships tried to gang me last night on the way here. That's all, Scotty. I'm signing off."

"All clear, Bill," Scotty answered.

Bill Barnes eased back on the control column of the Scarlet Stormer as the big red ship skimmed the waters of Biscayne Bay, off Dinner Key. The pontoons left a gurgling wake on the

for action. I'll contact him a little later."

The man in the speed boat swung around in a wide circle and headed back for the Key. Bill watched him for a moment, then spoke to Red and Cy.

"Stick in your ships," he said. "I just had word from Bone. We'll be leaving here in about thirty minutes for Havana. Sandy, you take the Eaglet off when you get the transport in the air again. I'll tell you when. I want you and Red to ride on either side of the transport. I'll be just above you, out in front. We'll cruise above Havana, not too close, until we pick up six planes leaving the water there. They will probably be transports, twin-motored. Our job is to keep out of their way and jump 'em when they try to land up Cedar Keys way on the Gulf. I have one of my hunches again. It tells me you'll live longer if you keep your eyes peeled to-night. Any questions?"

"Yeah," Sandy broke in. "When do we eat?"

"What's the matter with Charlie's ice box?" Bill asked, laughing.

"I mean real food," Sandy answered. "Charlie thinks all food grows in a can. That guy would try to serve a roast leg of lamb with a can opener."

"Shut up!" Bill shouted. "Cy, put McCoy on the rapid-firer if you have to use it. And I think you will. Be ready. All of you keep your eyes open. Stick close together and keep your running lights on. I want to study my maps for a few minutes. I'll give you the word when it's time to shove." He flipped the key on the radio and pulled out his map shelf.

But he didn't look at the maps. Instead, his gaze wandered across the waters of Biscayne Bay to the shore. The four props of a gigantic South American Clipper ship gleamed dully in the twilight within one of the Pan-American Airways hangars. Smaller twin-motored cabin ships nestled under its wide-spread wings. A twin-motored pusher stood on the apron in front of the U. S. coast guard hangar. Two stubby-winged biplanes with Whirlwind motors in their blunt noses crouched inside the hangar. Lights twinkled in the rambling Spanish houses in Coconut Grove. Men moved lazily along the decks of yachts drawn up alongside the sea wall. Music came across the water from an orchestra playing soft music in the mezzanine restaurant in the Pan-American administrative building.

There, Bill thought, is peaceful business, men building commerce. People living in luxurious houses and lounging on the decks of yachts. Life doesn't touch them as it touches me. They don't know that I am out here with three ships loaded with death and destruction. Death and destruction to

destroy an insidious growth that is feeding on the very foundation of the country. Making dope addicts of children. He stirred uneasily as Morton interrupted his thoughts. Bill asked him to repeat what he had said.

"I heard you tell that man to tell the coast guard to stand by, ready for action, with their planes. I wanted to tell you that their ships are not armed. They carry only a submachine gun.

"They won't be any good for this party, then," Bill said grimly. "This job calls for mounted machine guns and men that know how to shoot 'em." He flipped the key on his radio again.

"All right!" he barked. "Take the bomber off first, Cy. Then Red. Break out the Eaglet when you get to ten thousand, Sandy. Cruise at one hundred and fifty. It's early yet."

The backwash from the twin adjustable-pitch propellers in the noses of the two fifteen-hundred-horse-power Diesels mounted in the wings of the bomber, churned up the water of the bay as they thundered their full-throated bellow.

Bill Barnes threw up an arm as the monster low-wing monoplane taxied into the wind and rolled down the bay with the grace of an ocean greyhound. With both of the huge Diesel power plants roaring, and the self-adjusting props set for the climb, the flaps came down and the huge, flying dinosaur sped into the air to be followed a minute later by Red Gleason and his Snorter.

Bill waited until they were climbing steadily upward. Then he kicked the Stormer around into the wind and thundered into the air like a dark-red bolt of light.

It was dark now. But the tropical moon gave to the world the eerie light of an early dawn. The fronds of royal palms, silhouetted against the deep-blue sky, swayed grotesquely in the faint trades from the Gulf Stream. To the north the lights of that fairyland that was Miami, spread out endlessly.

Bill Barnes laughed harshly. The playground of America, they called it. He compared it to a playground built in the center of a teeming tenement. A place where around the corner the whine of bullets, the roar of guns and the screams of gangsters could be heard. Danger amid gaiety.

"I don't like any part of this, Morton," he said into his intercockpit telephone. "It smells like the old double cross to me."

"All right, kid," the lean-faced Texan, Cy Hawkins drawled to young Sandy, as the altimeter of the transport-carrier climbed to ten thousand feet.

Sandy was out of the co-pilot's seat and down the steps to the main section of the fuselage, where the Eaglet was stored, in two jumps. He clambered into the cockpit and strapped himself

in as Miles got ready to work the mechanism that lowered the little fighter.

When Sandy flipped up his hand, two sections of the fuselage floor slid back to make a gaping hole. A long, lattice-like trapeze lowered the small, single-seated biplane through the aperture.

The tiny plane hung suspended, gently swaying back and forth from the force of the transport's engines. The wings snapped out and locked as Sandy manipulated a crank. The prop turned over as he worked his starter. The engine caught and the propeller became a black disk in the moonlight. A few minutes later the hanger hook was released and Sandy rode the Eaglet in a dive toward the waters of the Straits of Florida.

As it came out of the glide, Sandy brought the stick back and brought it over in a tight, flashing loop. He rolled dizzily from side to side, did a split S and a chandelle.

"All right! All right!" Bill growled into his microphone. "Be your age!"

"It's the Eaglet, Bill," Sandy answered. "She's got the bit in her teeth. I'll have to let her run it out." He came up in the first half of a normal loop and from an inverted position at the top half rolled the ship level.

"See if you can get her over there on the other side of Cy without having her break her saddle girth," Bill answered. "You'll need all your tricks before you get her back aboard the transport."

An hour and a half later the lights of the city of Havana twinkled below them. Bill ordered the little squadron up to fifteen thousand feet. They cruised in a widening circle watching the harbor for the running and landing lights of the contraband-carrying planes.

After fifteen minutes Bill spoke to Sandy over the radio phone. "Get down close to the harbor," he said, "and take a look around. It's about two minutes of ten. Idle your motor down as much as you dare and keep between the city and the wind. Make contact as soon as you hear or see any planes."

Sandy's running lights became mere dots, disappeared as he stuck the nose of the Eaglet downward in a series of shallow dives.

At five minutes after ten the red light on Bill's radio panel gleamed. He threw the key and heard Sandy's excited voice.

"A half dozen twin-motored transports are warming up south of Havana," he announced. "I went as low as I dared, but I couldn't get much of a look at them. I could hear them, though—they're not silenced. They're amphibians and carry the customary running lights. What shall I do?"

"Stick down there," Bill said sharply. "Give us their course after they're in formation. Let us know anything you learn about them."

X—SHORTY'S MESSAGE

BILL BARNES cursed mentally as he gave his three ships a course that would take them over the Dry Tortugas and into the Gulf of Mexico.

"Turn out your running lights," he ordered. "Keep the same formation. Speed, two hundred. I'll give you the changes as they alter their course."

Eight thousand feet below them they could see the running lights—red on the left, green on the right—of the six large smugglers. They were flying in a route column with only a few feet separating them from one another.

"I could knock 'em all out of the air with one burst from our one-pounder," Cy Hawkins said, hopefully to Bill. "McCoy is itching to use it. He says he never did like smugglers of Chinese."

"Tell him to mind his own business, fella," Bill answered. "We want these birds alive. We're going to stick right here where we are until they make a landing. If the dope we have is right it will be at Cedar Keys in about an hour and three quarters. Perhaps longer."

He probed the night air above and below the Stormer. Across the waters of the Gulf danced a golden pathway that was the reflection of the moon. The six speeding transports stood out in bold relief. Bill knew that they could see his four ships as clearly as he could see them. Yet they paid no attention to him, holding a true course to the northwest as though they were alone in the sky.

He told himself again and again that it didn't make sense. He tried to tell Morton the same thing. But Morton laughed at him. He could see the six planes beneath them. That was enough for him. He believed in the power and clairvoyance of Taggart Bone. If Bone said they carried dope they must carry dope.

But Bill was not satisfied. The whole plan was too simple. The man who had organized a dope ring of such stupendous proportions would not trust a large fortune in dope to six unprotected planes. Bill tried to make Morton see the logic of that. Again Morton laughed.

"All right!" Bill said grimly. "But I'd advise you to break out that swivel gun back there." Suddenly his bronze face grew tense and troubled under the glow of the light from the instrument panel. He had a hunch of impending evil. He looked back and up over his shoulder. For an instant his face was frozen with horror. He pointed a finger into the night and closed the nonshatterable hatches over their heads.

"Now you'll take it and like it!" he shouted at Morton. He switched out the intercockpit phone and threw the radiophone key.

"Battle stations!" he yelled. "Cy, put McCoy on the rapid-firer—fast! Two

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we'll both ride on it. I should have listened to you."

But Bill was not listening. He was watching four planes close in on young Sandy. Two of them were under his tail as he started to run away. He whipped the little Eaglet around in a flashing Immelmann and tried to climb away from them. But they stuck to him like a flock of vultures.

Suddenly he whipped over and flew back toward the circling biplanes. White streamers cut through the moonlit night as the first biplane fired. Orange flame spouted from the muzzle of its 20mm. gun. At that same instant Sandy did a complete roll, turned left and came up above that first biplane. He half rolled and dived with his guns chattering. As the biplane veered away he whipped about in a vertical spiral.

He rolled and twisted desperately to get out of range of the guns of the other three planes. They lined up and began to circle about him again to get him in the vortex of their fire. Bill swore softly as he saw what they were going to do to Sandy.

Then, as the leader opened up a cross fire, Sandy pounced again and attacked another biplane. He flew straight at it with both guns chattering. The deadly hail of lead drummed into the pilot's body and forward into the engine block. As it went into a sickening whirl Sandy zoomed upward. The Eaglet staggered and dropped into a side slip as the three planes sat under Sandy's tail and poured lead at him.

As Bill saw Sandy's ship stagger, he dove. He dove with his guns spewing death. He dove with the mad fury of a tribesman going into battle. The three biplanes dove and zoomed and skidded their ships to get out of his mad path. They might as well have tried to run away from a cyclone on the back of a cow. Bullets chewed through his wings and raked his tail assembly. The three ships streaked and tumbled through the night sky, filling the air with their lead. They fired burst after burst of fire into the Stormer. It did not seem possible that any ship could weather such a storm of lead.

But weather it Bill did. He was flashing through the sky in a series of lightning acrobatics that gave them no time to line him up under their sights. He dodged their bullets while he maneuvered to get them under his guns.

He knew that he was fighting with men who were masters of their craft. They knew how to counter every move. Only his speed and skill saved him from their deadly precision. He was giving everything he had to save his men and his ships from the murderous attack.

Lead drummed into his tail assembly again and crept forward toward his cockpit. He shoved the stick forward with all his strength. Five of the enemy

biplanes were on his tail when he came over on his back in an inverted loop. He centered his controls and rolled right-side up as they dove over him. Opening up his throttles he stuck the nose of the Stormer up in an abrupt climbing turn until it almost stalled.

Again Bill kicked his rudder and rolled to the right. The five biplanes broke in as many directions as Bill took the Scarlet Stormer into their midst with the speed and fury of a hurricane. His fingers were fastened down hard on his gun trips. He raked the rugged biplane in the lead with a withering fire. He saw the pilot fall over the coaming as the plane started a fluttering descent, out of control.

He gunned his engine again and came over in a normal loop on the tail of the last plane. His tracers curled above the engine block. Black smoke that was followed by orange flame licked back along the housing. The pilot sent his ship into a desperate spin to kill the flames that licked back toward his petrol tanks.

Bill zoomed up above the transport and probed the dim light of the moon. He saw that Red and Sandy were back on each side of the big bomber. Cy was holding the ship at an even two hundred miles an hour. The four remaining biplanes had disappeared as swiftly as they came.

Far ahead Bill, could make out the dim running lights of the six contraband carriers. They were still moving along in a route column. They had held their course as though they were oblivious to the thundering guns above them.

"Bill," James Morton said into the intercockpit telephone, "the next time you're going to do that, tell me. I want to stay home. I don't want any part of it. A bullet came up through the fuselage between my knees. They're still shaking."

"I must be wrong about those six transports," Bill laughed. "They must be carrying something valuable or they would have joined in the battle. They had orders to keep going and keep out of it. That doesn't fit with the way I figured things."

His face was lined and drawn now, from the terrific pressure he had been under during those few minutes of fighting. He switched on the radiophone and was about to speak in the microphone to Cy, Red and Sandy, when a voice sounded in his ears that brought him up straight in his seat, straining to catch it.

It was the voice of Shorty!

It was far away and indistinct. But Bill recognized it. He shouted Shorty's name into the microphone a half dozen times, then listened. Shorty's voice came back to him again.

"I get you, fella!" Shorty said. "I can hardly talk. A couple of guys tried

to tear out my larynx. Can you hear me?"

"I can hear you!" Bill shouted. "Where are you?"

"I've got to talk fast, Bill. I don't know just where I am. I know it's some place in Maryland. Listen, and I'll tell you. All hell is going to break loose soon, Bill. Don't ask me a lot of questions. Listen to what I tell you whether you believe it or not."

"Shoot, fella," Bill said. He was straining to catch Shorty's every word. He knew that Cy and Red and Sandy were tuned in to hear him, also.

"Hold the transport steady, Cy," Bill said. "Never mind those ships ahead."

"Let 'em go!" Shorty said huskily. "They are only a decoy. So are the boats that put off for the Florida Keys. They are all red herrings drawn across your trail. A dozen planes are slated to leave Cuba at about eleven o'clock—after you were out of the way. They're going to fly from Cuba here with their loads of dope. It's the largest shipment of dope that has ever been made into the country."

"You've got to pick up those ships, Bill. They're blue biplanes, the kind that jumped you over Lake Ontario the other day. They're armed to the teeth and will have an escort with them. You'll have to locate them to follow them here."

"You've got to find this place, destroy it. It's something out of Dante's mind. Q-1 is the identifying symbol of the man behind the thing. Get it? Q-1."

"I get it," Bill said.

"The man who picked me up is here. He is the man who came to see you. The man you sent me to tail. His name is Temple. He is known as Q-2. They have a mad scientist here. He silenced their planes for them. Now he is building steel men. I mean it! Robots, that will take orders. Thousands of them. And they have thousands of planes that can be radio-controlled from here and flown by the robots. They are going to put a fleet of ghost ships in the air, Bill!"

Perspiration rolled off Bill's face as he listened to Shorty's mad-sounding story. He checked an impulse to speak, then couldn't control himself any longer.

"Are you sure you're all right, fella?" he asked.

"Listen, Bill!" Shorty shouted angrily. "You've got to believe me! I told you not to interrupt me." He broke off.

"All right! All right!" Bill said, hastily. "Shoot it at me, Shorty!"

"They have their planes loaded with every destructive device known to man—and some that aren't known. They're waiting to get this shipment of dope in and distribute. That'll give them money to go ahead. They'll destroy cities and people indiscriminately. They'll fight a war that will be over in a week."

"You've got to stop 'em, Bill. You've got to get in here. It's an airport built

inside a cavern. An enormous place. I have control of the arsenal and all the landing and take-off devices. The side of a mountain opens up to let you in. You'll have to follow the dope ships to find it. I'll let them in. But I won't slow them up when they come in for a landing. They have a mechanism here like the one they use on airplane carriers. I'll let them come and crack up. Follow them in, one at a time. Take it easy.

"No more ships can get out of here unless I open the doors. I think I can hold out. I have machine guns and gas guns. Unless a lucky bullet gets me I can hold this end of the cavern. The only chance is that they get back to release their robots. Then nothing I can do will help. If they are released with the spark that gives them life it will be horrible. There are thousands of them. They would swarm over the country."

Bill was trembling with excitement and not a little sick at the things Shorty had been telling him. He didn't see how they could be true. Yet, he knew that he had to believe them. If Shorty said they were true, they were true. There wasn't any doubt about it.

"You'll have to pick those ships up in the dark, Bill. They'll take a true course from Cuba with their noses on this place. Say a line between Havana and Washington. You'll have to spread out."

"Is that all, Shorty? Can I call you back?"

"That's all, fella. For Heaven's sake, don't miss them! You can't call me back. I'm taking a chance during a lull in the battle in here to contact you. I won't dare try it again. You'll have to take a chance on my being alive to check your ships when you come in."

"Is it large enough to hold the transport?" Bill asked.

Shorty laughed a hoarse, unnatural laugh.

"It's large enough to hold a dozen battleships, fella!" he said. "I'm signing off."

XI—SILENT ATTACK

BILL LISTENED to the excited voices of his pilots for a moment after Shorty's voice died away. They were all trying to talk into their microphones at the same time. They sounded like a Chinese wedding. Bill shook his head wearily and shouted, "Shut up! I'll have orders for you in a few minutes." He threw the key on the radio and spoke to Morton.

"This is going to be tough going," he said.

"What is it, Bill? I made out that you were talking to Hassfurth." His brown eyes were gleaming with excitement.

"You'll have to listen and not interrupt," Bill said. "You'll have to believe

it just as Shorty told it to me. It sounds incredible. But if Shorty says it's true—it's true!"

Bill related his conversation with Shorty as accurately as he could remember it. He added nothing and took away nothing. Morton stared at him incredulously as he told it. He interrupted Bill only once.

"Do you suppose they could have filled Shorty with dope and then made him tell you this fantastic story?" he asked.

Bill gave him a withering glance.

"Calling all planes! Calling all planes!" he chanted. "I want you all to chart a course from Havana to Washington, D. C. That will be the line of flight of the dope ships. Sandy, you cut due east from here and patrol from the Florida Keys to a point near Melbourne, Florida. That will be over Lake Okeechobee and the Everglades. Watch it and keep plenty of altitude."

"Cy, you head for a point about fifty miles east of Daytona Beach. Patrol from there southwest to the Florida coast."

"Red, cut for Jacksonville. When you get there cut due east to the spot the dope ships will pass over if they take a water hop from about Melbourne, Florida to Charleston, South Carolina. Patrol back and forth. I am going still farther north. Make contact with me every fifteen minutes."

"If you sight the dope ships keep out of sight yourself, if you can. Report their position immediately and keep on their tails. The squadron will re-form on the tails of the dope carriers when they are sighted. What about fuel, Sandy?"

"Plenty," Sandy answered, "unless you're thinking of going to Australia."

"All right! Let's go! Shorty's in a fine jam!"

Bill eased the stick of the Scarlet Stormer back and opened the throttles. The motors roared as the twenty-four hundred horses propelling the ship took it through the soft night air with the speed of a bullet.

The waters of the Gulf of Mexico, golden in the moonlight, flashed under his wings and were gone. Below him, Big Cypress Swamp loomed black and desolate and terrible. He kicked his rudder and sped above the great stretch of water that is Lake Okeechobee, scrub and sand, pines and palm trees, dotted here and there by the lights of a town. They spread to their posts.

He listened to the reports of his men every fifteen minutes as the cities of the eastern coast flashed beneath his wings. A great white boulevard spread out at the ocean's edge at Daytona. A boulevard of sand on which man had driven automobiles at nearly three hundred miles an hour. His air-speed indicator registered over four hundred

miles an hour as he sped above it. The lights of Jacksonville rivaled the constellations overhead in brightness. Then they were gone as he circled the curving coast line of Georgia and cut east over the Atlantic Ocean.

Bill answered the occasional questions Morton put to him with monosyllables, hardly conscious that he was answering. He was going over and over the situation confronting him. Some of the loose ends he could tie up. Others puzzled him. Why had the man Shorty called Q-1 picked up Shorty? He tried to go back over the enemies they had made during the past few years. Many of them were dead, many in jail. He tried to check on the ones who might be at liberty to plot a mad scheme like the one Shorty had turned up. His thoughts always went back to the Eurasian, Otto Yahr. But Yahr was dead. And the men who had plotted with him were dead. Chian Lo, the Chinese war lord, was dead—

Each time he came up against a stone wall, only to start over again. Well, he would have the answer by morning. Or it wouldn't make any difference to him. He would be dead—

An hour passed while he patrolled between Savannah, Georgia, and a point one hundred miles due east of that city, over the Atlantic. Just after his men had checked in for the fourth time during that hour the light on his radio panel gleamed red again.

"Here it is!" he said to Morton and tuned in the radio.

Sandy's shrill voice came back to him. "I picked 'em up, Bill!" he said. "Over Fort Pierce, Florida. They are following the coast line north. I'm high above them. I don't think they have spotted me. There are four V formations of five planes each. I think the top layer and the lower one are the escort. The two in the middle are probably carrying the dope. They're all just like the ones that jumped us over Lake Ontario and over the Gulf. They're holding a speed of about two hundred an hour."

"Right, kid," Bill said. "Stay on their tails. Keep sending your position. I'll have Red and Cy join you. Keep high enough so they won't hear you. But don't lose them. I'll pick you up near Savannah. Feed the Baglet juice if any ships cut out of the formation to attack you. Remember that!"

"I'll remember, Bill."

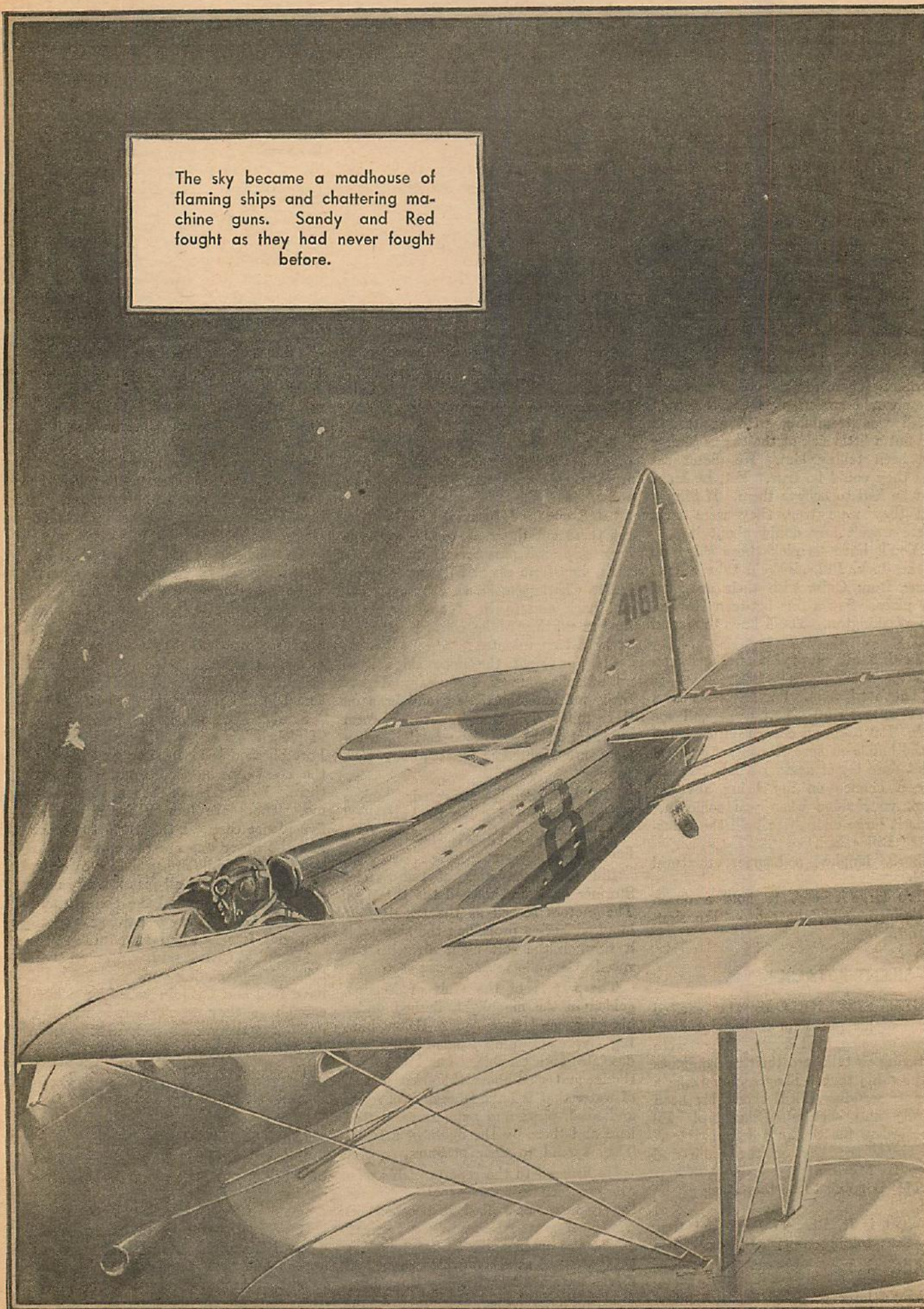
"Cy, are you and Red all clear?"

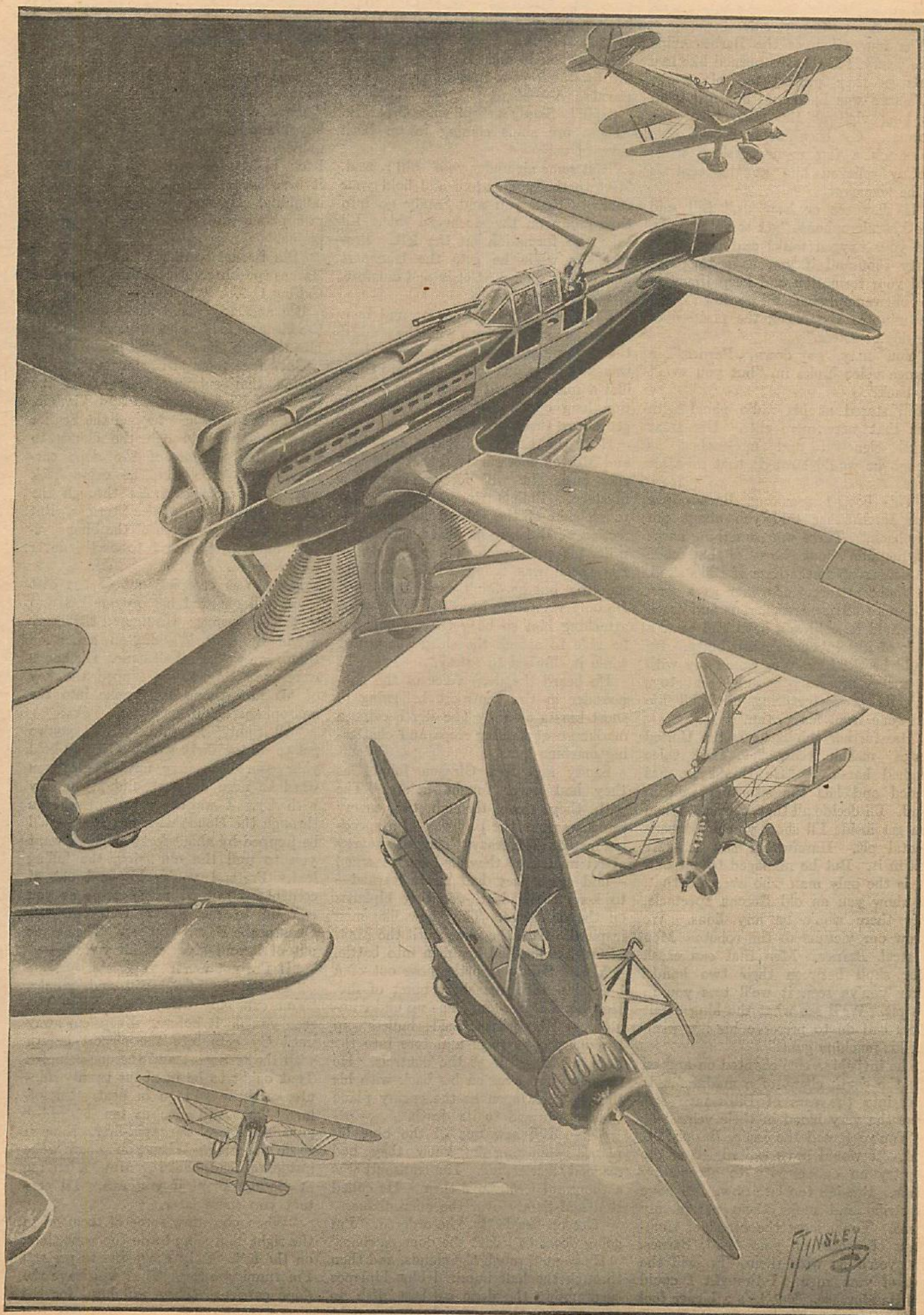
"All clear," they came back.

"Shorty's in a tough spot. We've got to get him out. Use your heads. I'm signing off."

It was two o'clock in the morning when Bill kicked the Scarlet Stormer around and took a position a thousand feet above and in front of his transport-carrier again. Red Gleason was back at his old position on the starboard side

The sky became a madhouse of flaming ships and chattering machine guns. Sandy and Red fought as they had never fought before.





of the huge bomber. Young Sandy rode his Eaglet on the port side.

The four pilots of the Barnes ships were weary. Their eyes burned like live coals as they probed the night air. Bill's face was lined and haggard from his long vigil at the controls of the Stormer. Cy Hawkins had been able to snatch a few minutes' sleep while McCoy relieved him at the controls of the transport.

"If they see or hear us," Bill said into his microphone, "get some altitude. Use your oxygen tanks and get up to thirty thousand if you have to. But hold your formation and keep tuned in on your radiophone. I'll go down every few minutes and check the position of the dope carriers."

"You may go down, Barnes," a strange voice broke in, "but you won't get back!"

Bill stared at his radio panel with eyes that were mere slits. His great hands clenched and unclenched as though he would strangle that invisible voice.

"This is Q-1 speaking, Barnes, the man Hassfurther told you about not long back." There was something harsh and metallic about the voice that made the hair creep at the base of Bill's skull. He could picture the owner as a man who was ruthless, treacherous and cruel. He would be cold and hard and wear a mask of absolute imperturbability. He would be the kind who would toy with an enemy the way a jungle cat toys with its prey—torturing until all life had gone from his victim.

"Hassfurther thinks he is the United States marine corps." The voice laughed harshly. "He thinks he has landed and has the situation well in hand. I'll decide all that, Barnes. When you get inside I'll show you my experimental pit. Hassfurther saw it. He was in it. But he managed to get out. He is the only man who ever did that. I'll show you an old Roman spectacle, only there won't be any lions. We throw our victims to the robots. Men of steel, Barnes. Men that can crush your skull between their two hands! After you've seen it we'll toss you in the pit. We'll see what the king of air pilots can do to preserve his life without his machine guns!"

The invisible voice chanted on and on like the death chant of a madman. It beat into the ears of Bill's men and froze the very blood in their veins.

"You've forced the issue, Barnes," it said. "I would have waited, given the country an opportunity to accept my terms. But it's too late now. I'll have to strike and make them accept my terms. You'll have the blood of thousands of people on your head, Barnes. But you'll be with them. So will the rest of your men. I thought I could use Hassfurther. But he's a bigger fool than I thought. He has served his pur-

pose now. He'll go with you. I could have wiped you out long ago if I had wanted to. But I wanted Hassfurther to bring you to me. It will be a pleasure to watch your face when we meet, Barnes. A—"

"Bill!" Sandy's shrill voice broke in. "There are ships coming in on both sides of us!"

"Get some air under you!" Bill roared. "Get to thirty thousand and hold your course! Red, you and Sandy go into that group on the starboard side. I'll take the formation on the left. Protect Cy while he gets the transport above their ceiling. Get in and out fast. Keep on their tails!"

Bill kicked the Stormer around in a wide, sweeping left turn while he studied the oncoming planes. He knew there was only one thing to do. Go into them like a madman and break their formation long enough to give Cy time to get above their bullets.

How the Scarlet Stormer and Bill, and Morton ever survived that first terrific onslaught will forever remain a mystery. Bullets ripped through the tough skin of the ship from every direction as Bill tore in with his throttles wide, his guns belching fire and death. His speed was too great for accurate shooting, but he didn't care about that. He only wanted to keep the dozen ships attacking him so busy they would not be able to attack the slower transport while it climbed to safety.

He heard the deep voice of the one-pounder in the transport bellowing in short bursts of fire. The sky became a madhouse of flaming ships and chattering machine guns.

Sandy and Red Gleason fought as they had never fought before. The path they wove through the enemy ranks was like the pathway of a speeding meteor gone crazy. They used every aerial maneuver they had ever learned—and some they had never learned—to keep those death-vomiting biplanes on the defensive. They flew like men inspired. With the same spirit the Maid of Orleans had led her men into battle.

Young Sandy tore the nose out of a blue ship with one short burst of fire. He whipped over and came up under another. His guns laced bullets up through the fuselage and tore into the body of the man at the controls. He came up and over on his back with his throttle wide open as the enemy plane spun downward to its death.

When Bill saw one of the blue biplanes wallowing he knew they had reached their ceiling. The transport was a thousand feet above them. He called Red and Sandy over the microphone.

"Get up beside Cy," he ordered. "I'm going down to locate the dope carriers."

He went through the clouds, and then through the half hundred blue biplanes surrounding the dope carriers, with no more finesse than a freight train might

use going through a house of glass. He went through them with sheer force of will and courage, and the terrific speed the Stormer gave him. He went through them and was away before they realized he had arrived.

Perhaps it was that touch of small-boy bravado that is in every one that made him laugh to himself as he climbed back beside his other ships. Perhaps it was something else. But he was laughing. He flipped the switch on his radiophone and spoke into the microphone.

"Bill Barnes speaking," he said. "Bill Barnes speaking. I am calling Q-1. . . . Calling Q-1. . . . Calling Q-1."

But no voice came back to him. Only the drone of his own motors came to him through the cold, still air.

Bill's face remained grim and terrible during that running fight across the States of North Carolina and Virginia. Time after time he whipped the Scarlet Stormer down through the clouds to verify the position of the dope carriers. And each time he came back with a new set of holes through the wings and fuselage of the Stormer. But each time one or more of the blue mystery biplanes fluttered to earth, never to fly again.

Dawn was creeping out of the east when Bill checked his instruments and took his bearings. He figured that they would be over Washington and then Baltimore within a half hour. His hands were trembling as he flipped the key of his radiophone and spoke into the microphone again.

"All right," he said. "Red, you've got to do the dirty work. Cy, you hold your course up here until I give you word to nose down. Sandy, you stay with Cy. I want you to come down through the clouds with me, Red. We'll be jumped by about forty ships. I want you to pull the old trick, the falling leaf. Pretend you're hit and out of control. Draw as many ships as you can off to the right. Get 'em over Chesapeake Bay if you can. Then come out of it and give 'em all you've—"

"If I'm not dead!" Red said.

"That's the idea," Bill said, grimly. "You can stay away from 'em. I've seen you do it before. Keep 'em away until Cy gets into the airport cavern with the transport and the one-pounder. That ought to be in about twenty minutes. Sandy will go in next. I'll follow. That will give us ten .50-caliber guns inside, and the rapid-firer. Enough to do the trick. When you're sure we're inside, or dead, beat it. Make a landing at Bolling Field if you can. I'll contact you there later."

"When you draw some of them off to the right I'm going to do the same thing on the left. Only I'm going to pretend I'm running away. That will leave the dope carriers. They will head for the airport cavern. Cy, you get down low

enough in fifteen minutes to follow them in. Do you all get the idea?"

"It's a sound idea, if it works," Cy drawled.

"Good Lord!" Bill growled. "We'll make it work!"

"Let's go!" Red shouted.

Young Sandy Sanders groaned as though his whole body was racked with agony as he watched Bill and Red dive their ships into the middle of that formation of blue planes. It did not seem possible that the two lone ships could survive the withering and relentless fire that was turned on them. The forty or fifty biplanes guarding the dope carriers separated as though at a given signal, half of them pouncing on Bill's Stormer, the other half on Red's Snorter.

Sandy groaned again as the hole in the clouds, through which he had been peering, closed. But he had seen enough to know that Bill's plan had worked. He saw Bill streaking off to the west with a string of blue biplanes spread out behind him. And he saw Red's Snorter fluttering to earth with twenty planes darting in and out, firing burst after burst of fire at what appeared to be a ship out of control.

"All right!" Bill's crisp voice came over the ether in Sandy's ear. "Nose her down, Cy. You and Sandy follow the dope carriers wherever they're going. Go in after them. Take it easy. Go in slow. Shorty said he would let the dope carriers crack up and then slow you up. But Shorty may be dead. You may have to skid in on your pontoons. You won't be bothered when you come down. I led half the escort away and lost them when I got above the clouds. I'll be right on your tail."

Bill Barnes could hardly believe what he saw when he nosed the Stormer down through the clouds and dove to a position just behind his huge transport.

He saw the ten speeding biplanes a little ahead of the transport, and a little below it. They were nosing their ships down and cutting their speed as they headed straight toward the side of a mountain—a mountain that rose five hundred feet above them at their present altitude. But on they went as though they were going to stick the noses of their ships into the side of it.

He could see no break in the sharp escarpment. Then the mountain opened up as though some huge shovel had scooped a hole out of its side! What appeared to be trees and boulders and brush disappeared as the great hole appeared—a hole that was at least five hundred feet square!

He saw the ten dope carriers speed into the opening and disappear. He held his breath and gasped with mental agony as he saw Cy nose the transport down and fly into the yawning mouth, with Sandy on his tail.

Perspiration was running off his face

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in streams as he flipped a hand at Morton and stuck the Scarlet Stormer into the chasm.

For an instant there was darkness. Then the place became as light, if not lighter than the day outside. The Stormer's powerful motors reverberated back and forth across the cavern with a roar that deafened them. Great floodlights gleamed on every side. The Stormer was flashing ahead at a frightening speed.

Then it slowed down suddenly, to half its former speed. It was as though an invisible hand had caught it by the tail to retard its forward motion.

The monster transport loomed ahead with Sandy's Eaglet drawn up under its wings. Bill rolled up beside it and killed his engines. As their roar died away another roar took its place. Bill saw orange spurts of flame jetting from the nose of the transport and Sandy's Eaglet. He heard the deep bark of the one-pounder in the transport and saw McCoy throwing shells into the breach.

"Good Lord, Bill! Look ahead of you!" Morton shouted in his ear.

Bill stared with the expression of a man who has been roused from a horrible nightmare.

Moving at them was a solid wall of black things that resembled men! They were moving forward with a slow precision that was like the advance of a tidal wave. As machine-gun bullets and one-inch shells tore their ranks apart others came on from the back to fill their places. There was no noise about them. They were silent and terrible and frightening. What resembled an arm would fly off. But it would not stop the advance of the thing to which it was attached. Only when the torsos or legs were riddled did they stop and crumple up like falling wooden soldiers.

Bill's finger clamped down tight on his own gun trips. His powerful guns joined the chatter of the guns in the transport. The things were only two hundred yards away now, coming onward as inevitably as death itself. Bill and his men were fighting with a desperation born of frantic fear. They were fearless in the face of anything human.

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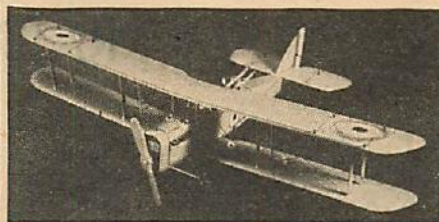
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But these things were not human. The relentless, silent march filled them with panic.

Then Bill saw that the forward march of the mechanical men was being slowed up by the ones who fell, twisted and torn. The ones from the back kept pushing forward. They were piling up higher and higher. The ones in the back were trying to walk up and over the wall of steel.

The wall climbed toward the ceiling as McCoy poured round after round of one-inch shells into the robots. They slid down the side until the pile looked like a huge hill of twisted scrap iron. It rose to the top of the cavern as the robots kept piling up. It became a wall of protection a fortress in front of them.

It was then that Shorty came rushing out of a steel door off to the left and staggered toward them. His face was swollen and battered, and covered with grime. But he tried to grin.

"You made it, fella," he said to Bill as Bill leaped out of the Stormer and threw an arm around his waist to keep him from pitching forward on his face.

"Can they get through any other way?" Bill asked.

"Not a chance," Shorty said. "They've sealed themselves up. We've got places to go yet, fella. Leave Cy here with the transport. He can hold the place. We've got to get Q-1."

"Do you know who he is, Hassfurth?" Morton asked.

"I'm the guy who knows," Shorty grinned horribly. "It's—"

"Hold it!" Bill said. "I think I know, too. We'll take Morton along and introduce him. How did you make certain?"

"Q-2 told me," Shorty said. "I had

my suspicions before I got hold of Q-2—the man who called on you. He tried to get into the arsenal a while ago. I let him in and nabbed him. Then I made him talk."

"Otto Yahr's old friend?" Bill asked. Shorty nodded.

XII—Q-1

A HALF HOUR LATER Bill set the Scarlet Stormer down on the ground at Bolling Field in Washington. He and Morton helped Shorty into a taxicab. The cab took them to the yacht basin Bill, Morton and Sandy had visited the day before.

"I'm going to report to Taggart Bone now," Bill explained to Morton. Morton nodded, sullenly. He had tried to persuade Bill to tell him the identity of Q-1. But Bill had remained adamant. "You'll know shortly," was the only satisfaction Morton could get.

Taggart Bone was sitting in an overstuffed chair in the lounging salon of the *Priscilla* when the quartermaster ushered them in. He extended his hand to each of them and greeted them with his usual charming smile.

"I've been worried about you, Barnes," Bone said.

"I imagine you have been," Bill answered. His face was grave as he studied Bone with a level gaze.

"Barnes says he knows where we can find the leader of the dope ring," Morton put in. "He knows who he is."

Bone's gray eyes gleamed. Otherwise his face remained inscrutable.

"Bone knows who he is also," Bill said, quietly.

Morton looked from one to the other, amazement stamped on his features.

"Listen!" he exploded, "I'm fed up on this mystery stuff. Who is this Q-1?"

"You're looking at him!" Shorty laughed. "Q-1 is our little pal, Taggart Bone!"

In spite of his bruised face and battered body Shorty moved like a man on steel springs as he spoke. He took two steps as Bone whirled and his right fist exploded on Bone's jaw. His left crashed on Bone's temple as he fell.

"I'll feel safer with his hands tied," Shorty said, as he kicked an automatic out of Bone's lifeless hand.

"Still have the old sock with you," Bill said quietly, as he took the wire off the back of an etching and secured Bone's hands behind his back.

Morton was gazing at them like a man in a trance. He tried to speak, and couldn't. He could only make gestures with his hands.

Bill looked at him and laughed.

"You see," he said, "I finally remembered where I had seen Bone before. He has been smuggling dope on that yacht of his for years. He was mixed up with Otto Yahr and Chan Lo, a deposed Chinese war lord out in China. One time they captured Shorty and the Scarlet Stormer. They used Shorty as a decoy to lure me to Borneo. They had a scientist working with them who invented a death ray that could be shot from planes. That scientist escaped when we cornered Otto Yahr. He made those steel men."

"Bone learned his villainy from Otto Yahr and Chan Lo. This whole thing was stamped, 'Made in the factory of Otto Yahr.' This cleans up the last of Otto Yahr's gang."

"Yeah," Shorty said, speculatively. "They'll hang Bone or send him to Alcatraz to watch the sea gulls for the rest of his life."

RAIDERS OF THE BEAM

(Continued from page 24)

"Met. office, looking over the map. We'd better go right on through. There's a navy blimp up somewhere between Camden and Newark. Got a bum motor."

"Swell! Just to make it harder. All clear?"

"All clear!"

The big Gordon raced into the cotton again. Milletts climbed over Latrobe and switched in his beam set again. He caught it at 4,000 and headed east to pick up the western leg of the Bellefonte beam.

Miss Crowell came up from the cabin and leaned over Dick's shoulder. He was jotting down the time on the F. O. R. sheet. She waited until he had finished and then said: "Something funny going on back here. This new

man we picked up at Pittsburgh is passing notes to the fat bird with the face."

Dick Thurlen stared at his reflection in the rev meter and remembered those packages up front.

"What's up?" demanded Milletts.

"Something screwy. A guy who just got on is pulling a barney with those two mugs that started with us. They're passing notes."

"You've been reading the funny papers. What of it?"

"Nothing. Only—well, why don't they talk, if they know one another? O. K., Dale, keep your eye on 'em," Thurlen added.

"Hell!" gasped Milletts. "The beam's out!"

Thurlen jerked and then sat tense

and tried harder to listen. The pilot swung the ship back and forth for some time, but got no response in his headphones.

"Call Newark and find out if they're on."

Dick snatched at the hand mike and placed it near his mouth.

"Plane No. 702 to Newark. Go ahead, Newark."

Milletts gripped his wheel hard and stared over at his co-pilot. No answer.

"Try 'em again!" Milletts barked, swinging the wheel gently as he nosed his craft through the fog, trying to pick up the western leg of the Newark-Bellefonte beam.

"Plane No. 702 to Newark—Come in, Newark. Come in, Pittsburgh."

They sat and stared at each other

again, while the instruments danced before them as Milletts tried to fork his nose into the beam area.

"What the hell?"

"Why don't some one reply?" demanded Thurlen. "Damn! A fog like this and not a buzz out of her."

"You asked for it—you'll get your four hours, Thurlen." Milletts scowled. "Try 'em again. Don't sit staring into that mike!"

"Plane No. 702. Chicago to Newark—Century Air Lines—calling Newark—or Pittsburgh," Dick spoke carefully into the mike. "Want to report western leg of Newark-Bellefonte beam out of action. Is it turned on? We need it for Trip 9. Please answer, Milletts."

They listened again and caught everything on their fixed frequency set above their heads except a reply to their request for the beam.

"That damn gas bag is still up over Jersey somewhere—listen to 'em barking out Blau gas!" snorted Thurlen.

"To hell with it. I'm cutting south and heading for the Harrisburg-Camden beam. We can try to get into Newark on the southern leg of the Newark beam—if it's operating."

"If the western leg is out, how the devil do you think the other three segments will be in?" demanded the co-pilot. "They can't chop it off like a pie."

"Who?"

"Anybody. I was thinking that maybe some one was monkeying with the beam to get us down," Thurlen answered, a bit sheepish.

"Listen, you. Quit playing at soldiers. We got three-quarters of a million in negotiable paper up front—government stuff. It's got to go through to cover Century's bid for that proposed trans-Atlantic postal route. And it's got to be in Washington before noon to-morrow—neck or nothing."

Milletts was never so serious in his life.

A hundred thoughts streamlined through Dick Thurlen's mind. Four hours—three-quarters of a million—assure him a first pilot job, for life—Century's bid for the trans-Atlantic franchise—ceiling 600—and falling—guys out there passing notes—and Dale Crowell. They had to go through.

But Spring Milletts was punching him in the chest: "Come out of it, Thurlen. What's eating you? Get that set going and inform Newark we're swinging over to the Harrisburg-Camden—say! There's nothing phony going on, is there?"

Spring Milletts sat back and watched his compass show the letters SE in the small window. He was wondering about Thurlen and his almost insane desire to make this trip. Did he know this stuff was going through? Why did he leave the cockpit and go into the met. office in Pittsburgh?

For the first time in his life, he felt afraid—in the air.

But Thurlen was barking away again into the mike, trying to raise one of the stations. Milletts watched him out of the corner of his eye. There was a strange tenseness in the co-pilot's face as he tried again to make contact with the ground.

"Never mind!" Milletts snapped. "Here's the Harrisburg-Camden beam."

"ANYTHING wrong?" asked Miss Crowell, poking her head around the cockpit doorway.

"No. Why?" demanded Milletts. He no longer trusted any one.

"Nothing. Just a feeling, that's all."

"How are the bad-boy note passers?"

"That's it. They're terribly restless. I tried to get up a foursome of bridge, but they won't react. One of them keeps slipping back into the box."

"Nervous! So am I. Beat it, sister, and tell 'em some bedtime stories. We're busy."

Thurlen occupied himself filling in the check point reports on the F. O. R. sheet again while Milletts settled back to ride the beam into Camden. The tone was coming through now in comforting strength and Milletts began to feel more secure. He wondered whether he had let the strain get him. After all, he could understand Thurlen and his four hours. He remembered the thrill he experienced with his first air command. Then there was Miss Crowell. Some guys get all the luck. Milletts smiled to himself and felt that he had been born twenty years too soon. The war ribbons under the wings on his jacket—sure. That went well with the passengers, and the line liked you to put them up, but—cripes, the war had been over years ago. Makes a guy feel old now, to admit he had flown on the Western Front. Oh, well—

"What about that emergency set, Dick?" Milletts said suddenly.

"Was just going to try it. Just finish up this Coatesville check, and I'll try her."

In a minute Milletts ran into the cone of silence over the Camden beam and then turned northeast for Newark. He waited patiently for four minutes, easing back and forth in an effort to pick up the southwestern leg of the Newark beam. He frowned again and sat jittery.

No beam out of Newark!

"Hurry up. We're dead again. Get something!"

Thurlen was bending over the battery set fitted under his seat. He glanced at it and saw that the wave-length lever was swung over to the day frequency. He swung it over from 70 to 96 and then jerked up. With a puzzled grimace he stood and glanced at the set above his head.

The regular set above was set for the day frequency of 76 meters!

"No wonder!" he gasped. "You change this, Spring? We've been on day frequency all this time."

"Day? What the devil? I didn't touch it."

"We were working night frequency into Pittsburgh all right. How did that happen? No wonder we couldn't raise Newark."

"Wait a minute, Dick. When you were in the met. office at Pittsburgh, one of those guys—the fat black one, with the face—came up and stood in the doorway. He was asking about the robot pilot, and I was showing him how we swung it in. I wonder—"

"Oh, boy—now what?" Thurlen half whispered, turning and glancing back down the cabin aisle. He saw the tall thin man who had got on at Pittsburgh come out of the lavatory and hurry to his seat. He gave the heavy man—the man with the face—a knowing glance.

With a snatch, Dick swung the lever over to the night frequency point and started to bark into the mike.

"Plane No. 702 to WEGG—Flight 9 over Camden—come in, WEGG."

At first they got a garbled torrent of low carrier chatter about a non-rigid airship.

"Damn those navy guys!" Milletts barked. "Find out where the hell that gas bag is."

"WEGG to No. 702," came a strong tone over the speaker. "What's your position, 702?"

"Whew! That sounds good," beamed Thurlen across to Milletts. "Plane 702 on night frequency—over Camden. Where's the Newark-Camden beam? Shut off?"

"Sure it's shut off. It'll be out for ten hours, at least," a voice boomed out behind them.

Both Milletts and Thurlen stared up at the set above their heads, trying to fathom the strange voice.

Then Dick Thurlen turned sharply and saw the big man in the black coat standing in the doorway. He watched him reach up and snap out the set. A big black gun, looking big enough to have a set of wheels, was huddled into the palm of a big fat hand.

"That's all, boys," the man smirked. "The telephoning business is all over."

"What did you say about the beam?" demanded Milletts.

"I said she's out—out for the night. We took care of that."

"That's a laugh," Milletts replied. "How you expect us to get into Newark? I got to work from the cone of silence over the beam to make the runway. Last we heard the ceiling was 600 and dropping. It's probably all the way down by now."

"Sure it is. We know that. We been in touch all the time. Got a set in—

side, working it in the men's room back there."

"So what?" barked Milletts.

"You can't get to Newark. You can't get into Floyd Bennett. But you can get down at the emergency at Four Mile. It's about 400 there, but dropping, so you'd better work fast. Barometer 30.29—fix your Kollsman."

"You damn fool!" squawked Thurlen. "The beam's out and we don't know where we are. How can we find Four Mile in this?"

"You'll find Four Mile and set her down, or pile up and fry. Look, buddy!"

The big man yanked his coat open a trifle. Underneath they could see the webbing straps of a parachute harness.

"We came fixed, kid. Now you guys will put her down O. K., or we'll blow your heads off and leave you to it. What's the verdict?"

"Go to hell!" snarled Milletts.

Dick Thurlen reached out and held his hand before the muzzle of the gun: "Wait a minute! Wait a minute! Don't go off half-cocked. I'll—I'll put her down for you."

Thurlen's mind was racing. He glanced over at the compass. Still heading NE by N out of Camden—flying about six minutes—about 14 miles—should be over Burlington—Burlington—Burlington. He closed his eyes a second and stared at the map in his imagination.

"Well—come on. What about it, buddy?" the big man demanded, jerking Dick Thurlen out of his reverie. "Do you put us down?"

"You want to go down to Four Mile, eh?" Dick snapped, talking automatically. His mind was still doing plenty of revs. "You got to act fast, or I'll never find it."

"You do the acting, kid. I'll take care of this bozo."

He glanced down at Milletts. "Move out, monkey, and let a wise guy fly this crate."

He flipped the muzzle of the gun around in a thumb-jerking movement.

Dick took the wheel while Milletts raised himself clear.

"You lousy, double-crossing rat, you!" he snarled at Thurlen. "So this is your game, eh? Well, I hope you stick her down so hard, you'll go all the way through to China!"

"What's the matter? Don't you like life?" demanded the big man with the gun. "Get in there—and sit down!"

Dick slid over into the left-hand seat and steadied her. He was in command—his four hours were up—and ceiling 400—and dropping. Over Burlington—the course from there would be due east—thirty miles—about thirteen minutes of flight. He checked the clock and nodded.

"All right—no monkey work now, kid. You take her in."

"Wait a minute," Thurlen replied, staring ahead. "No rough stuff when we get down, either, remember."

"All you got to do, kid, is to put her down—and sit quiet for ten minutes. Then you can—you can fly the Atlantic, for all we care."

"That might be a good idea—after this," rumbled Dick.

"So what? Is it a go?"

"Sure. But you'll have to let me call Four Mile, to snap on their boundary lights. Give me a break of some sort. Ceiling 400—and dropping, remember."

"O. K. But not yet, kid. Not until we get on top of it. You ain't putting no fly cops on us that way. Where are we?"

"Over Media—a few miles west of Camden," lied Dick. "Look—right there."

The man with the gun stared down at the flight chart and frowned.

"What the hell! We were over Camden some time ago—when you called Newark!"

"Sure. What do you think we've been doing all this time—flying straight?"

"Ain't you?"

"No—not with a guy like you sticking guns in the cockpit. We've been circling—that is, Milletts did—to stall for time. We're about over Media."

The big man scratched one hip on the side of the co-pilot seat and stared at the map again. He smiled at the picture Thurlen had drawn of them circling while under the influence of—a gun.

"Then by flying due east, at the proper speed, you ought to hit Four Mile smack on the nose!" the big man said, after a few seconds of consideration.

"You're good," grinned Dick. "You ought to be in this racket."

"I am—for about three-quarters of a million, kid. Let's go."

DICK THURLEN never prayed for fog to hold before in his life.

He headed the ship around until the letter "E" appeared in the compass window. He wondered what Milletts was thinking. The big man in black signaled to one of the huskies in the cabin who had been sitting with a gun directed at Milletts' chest.

He assured his confederate that everything was hunky-dory.

"We're gonna signal the field at Four Mile to switch on their boundary lights a minute or two before we get there. That will help and it will tip Murph and Louie off that we're coming in, eh?"

The other man nodded and grinned. Milletts, who had heard what the big man in black had bellowed at his confederate, frowned.

"What the hell is he talking about?" he muttered to himself. "There's no boundary lights at Four Mile. It's just

an emergency field with a beacon. He's nuts!"

Well, they might as well get it good. Boundary lights on an emergency field!

Dick Thurlen held her dead on the course, gulping a prayer, as he counted the minutes, checked the revs, and figured the mileage. His mind was running across a mental map. Burlington—Wrightstown—twelve miles—open country—and then—

He turned and glanced back into the cabin. Milletts was sitting with arms folded, eyes set dead on him. They glinted like the muzzles of machine guns. Dick tried to give him a message with his pursed lips, but Milletts was boiling with rage, frustration and bitterness. Dale Crowell sat in back of him. The tall man was behind her, his back to the lavatory door, a bluish-black gun in his hand. She was completely expressionless. Dick didn't blame her for that. It was all too dizzy to figure out, anyway.

"Come on, kid. No barney business. Keep your mind on your work. Where do you think we are now?" the big man in black said.

"Where are we? Er, about over Medford. We ought to be there in four minutes, but I'll need those boundary lights, if it's bad below."

"Four minutes, eh? O. K., I'll give you the set. Who you calling?"

"I'll go out on night frequency, to Newark. I'll tell them we can't make it without the beam and that I'm over the Four Mile field and want their lights just to check their boundary. They'll figure it is better down here."

"O. K. But that's all, remember. An extra word—anything funny—and I'll blow your knob off, shove the robot pilot in, and we'll nose-dive overboard. Get it?"

"Sure, I get it. What do you think I am? I want to live. Snap that switch."

The man in black stood up and switched on the set above. Dick took the mike and chanted, while the man in black held the big gun three inches away from his nose.

"Plane 702 to Newark—O. K., Newark."

"Newark to Flight 9—come on in, Flight 9. Where are you?" the reply came back.

"Over Red Lion—heading for Four Mile emergency field—can't get through—no beam signal. Can make Four Mile field if they give me their boundary lights."

Then he turned quickly to the man with the gun: "Quick—snap it off!"

Without realizing what the game was, the gunman reached up and cut the set.

"What's the idea?"

"You don't want them to tell me to go to Camden—or through to Washington with the stuff, do you? I'm faking trouble!"

"Oh—I get it, kid. Smart stuff."

Dick Thurlen had no intention of allowing the Newark traffic man to bark back that there were no boundary lights at Four Mile.

"All right, now let me alone. Ten to one, the Four Mile beacon man will have picked up that signal, knowing we were in the air somewhere about here, and will switch them on himself. Otherwise it will take a minute or two to call the field man from Newark."

"The longer the better," grinned the big man in black.

"O. K. I'm cutting the gun to go down. I'll do about 100 and hope for a break."

"I'm with you, kid. Put her down."

THE BIG GORDON seemed to relax when Dick drew back the throttles. He held her in her glide and then yapped across to the man alongside him.

"Gear down! That steel lever there. You take a few orders, now."

"I get it, buddy. You do the talking."

Dick sat tense, trying to peer through the thick blanket that surrounded them. He watched his altimeter drop and leaned over and set it for barometric pressure. The green light flashed, indicating that the wheels were down and locked. He hoped that navy balloon was still out.

The altimeter said 800 now.

"O. K. Flaps down—that wheel over there—half a turn!"

The man with the gun twisted the air-brake flap wheel and they sensed the ship slow up even more.

"There's the lights—they're on," Dick barked. "Look—down there!"

The man in black stared ahead into the cottonlike mist. "Right on the nose!"

"Right on the nose!" echoed Dick.

"But, hell, kid—ain't it a small field? Don't look big enough to get into."

"You asked for it—there it is. Let me alone, I'll get her in."

The man in black gulped, turned and belled down the cabin aisle.

"O. K., Shorty! Get ready for business—we're in—"

Dick had held his height and was turning to go back and nose at the long way of the lights, strung out like a fantastic oblong jewel box.

"Can you make it, kid?" husked the big man.

"We got to, now, feller. Sit back, and hold your breath."

The big man wiped the perspiration from his forehead with a fat curved finger: "Hell! I didn't think it would be like this."

"It's gonna be worse," taunted Thurlen, his eyes dead on the oblong of twinkling lights ahead.

"It looks so black down there."

"Probably burned the field off recently. It'll look blacker."

The fat man turned and glanced down the aisle. His eye caught Millett's face and the pilot was grinning. The fat man could not make that out. He barked at the tall thin man to get ready to open the door. When he turned back, he swallowed hard, like a man trying to get down a raw egg.

"Hey! What the—"

"Too late now, buddy. Shoot, if you must, this old gray head—but you're too low to jump now."

"That's—that's a hangar—a big hangar— The lights all around it! Look out—you'll crash into it!"

Dick Thurlen laughed: "Crash into it—like hell! The doors are wide open. Watch us. We got 800 feet to land inside there."

And before the big man in black could do anything about it, the big Gordon had skimmed into the vast expanse of the Lakehurst navy dirigible hangar. The wing tips threatened to slash the

sides of a long silver airship that was hanging in ballast on one side. The flaps took hold and she slithered in and rolled up to where a company of marines, under a top sergeant, were standing at ease. Dick grinned when he spotted their side arms.

He held her there, turned on the fat man and said: "O. K., Beevo. Go to it. There's three-quarters of a million up front and a couple of boatloads of marines to see that you don't act nasty. What about it?"

But the big man in black could only sit back and stare around.

"You—you weren't over Media—then?"

"No—about sixteen miles northeast of Camden—over Burlington—directly opposite Lakehurst. Not Four Mile," grinned Dick.

"And the lights—you knew? The lights around the top of the hangar?"

"I knew a navy blimp was out somewhere, and that they were holding the hangar open for her, and that a ground crew would be handy. Took a chance, yes. But it was worth it. I got my four hours in, and—"

"You win, buddy!" gasped the big man in black.

But by then, marines were swarming all around the Gordon, and Spring Millett came up, shoved the big man in black out of the way, and glared down at Thurlen.

"You son of a gun, you even fooled me!" he growled. "But what a show!"

"I had to, Spring," gagged Dick. "Four hours—the dough up front meant more to me than—anything. You'll sign my book, won't you?"

"Any day—providing—"

"What?"

"I'm best man—at your wedding, at least. I'll never be, again, in a cockpit!"

"Sold! Come on, we got a story for those Leathernecks out there."

WINGS OF VENGEANCE

(Continued from page 30)

he caught sight of Pete Lester's hard-set face.

"Here, lend a hand!" he ordered. And once the three bodies were laid side by side, he said: "There'll be all their stuff in the cabin. Get it out, while I go back to the base and phone Pennerton."

Dupuis, the mechanic, came blundering through the undergrowth. He was gray-featured, horror-stricken. Bill ordered him to lend assistance to Lester, and continued his own way to the base, accompanied by the cook.

He put through the call to the Airlines president, ordered an ambulance for the bodies, and went back to the plane again. There he began a check-

over, trying to determine the cause of the wreck.

It was pretty much a hopeless job. Ailerons, elevators and rudder were all snapped or sprung. Jim had no way of knowing whether these breakages were the cause of the crash or the result of it. He quit at last, went down to the base again and met Pennerton, who had arrived with the ambulance.

The Airlines president was more unstrung than Jim himself. While lavishing sympathy on the victims, he was equally concerned with the black eye to the firm.

"And what the devil caused it—the wreck, I mean?"

Jim shrugged. "Too soon to jump at conclusions. That's for the inspectors to

find out." He went with Pennerton and the two men from the ambulance; stood by while the latter did their work. Pennerton shook his head.

"Ghastly. And McGillvray's claim remains unstaked—though that's the least worry."

"And that reminds me," put in Jim. "Either old Dan or Ed Durant had a map saying just where this claim is located. Don't you think we'd better take charge of it? If it got into the hands of the wrong people—well, you know what I mean."

Pennerton apparently did. With Jim, he crossed to where the luggage was piled on the broken wing. But a thorough search revealed no map.

"Funny," remarked Jim. "Maybe one of 'em had it on him."

They went down to the ambulance, where Pennerton requested that all papers in the two men's clothing be handed over to him for safe keeping. But again no map was in evidence.

"Durant must have thought he had it," decided Pennerton. "Chances are we'll find it in town."

Jim pondered the matter. "Yeah. Guess that's the only possibility."

Jim Brett went into Riverdale that day. Durant's body, following a telegram from Winnipeg, was shipped East. Art Nelson and Dan McGillvray were buried there. Art appeared to have been a bird of passage. Inquiries showed his parents to be dead, and his only relative was an uncle in Chicago. Jim gave heartfelt thanks for this. The meeting with Dan McGillvray's widow and Dan's crippled son was something he wouldn't forget.

It was the youngster who hit Jim the hardest. Lying there in bed in a neat little cottage, young Larry tried to put up a brave face.

"One thing," said the boy. "My dad died just as he always wanted to—with his boots on." Then, with a wistful half smile, he added: "If I could only be a man like him!"

Jim, looking at young Larry's pain-twisted face, remembered old Dan's one great hope. Jim turned to Dan's widow.

"About this claim, Mrs. McGillvray—do you know where it was located?"

The woman shook her head. "Dan made so many strikes, and all of them were going to bring us in a million. He was always chasing rainbows. And when he told me about this find he'd made, I didn't pay much attention. It seemed like all the rest."

"But didn't he say where it was?"

The woman clasped her hands in her lap. She was struggling to remember; and remembrance brought new tears to her eyes.

"He mentioned a lake, north of the Churchill, I think. It had an Indian name—I just can't remember!"

Jim nodded in sympathy. "Did he have a map?"

"A map? He had a great bundle of them. Wait; I'll get them out."

But they were just as the woman said—a great bundle. Going through them, Jim knew that the off-chance was hopeless.

"There's just one thing," added Dan's widow. "He always took a camera with him on these trips; and he showed me a picture of where he had made his latest strike." She walked to a cabinet, and came back with two or three snapshots that might fit almost any section of the North. One in particular was of a rocky point, a dead spruce leaning over in the foreground.

"May I keep these?" asked Jim. "There's a possibility that I might land

somewhere and recognize this place. It's a mighty slim chance, though."

He left them then, with a word of cheer for the widow and a firm handshake for the boy.

"Keep smiling, son. That's what your dad would do. If I find anything, you'll be the first to hear about it."

The government investigation into the crash proved nothing. The inspector went over the wrecked ship, cross-examined Jim and grilled Dupuis. Jim Brett pointed out that he had flown the plane in from the North only that morning, and had found it satisfactory in every detail. Pete Lester was emphatic that Art's grand-stand stunting was to blame. Jim was inclined to agree, with reservations. Somehow, Art was pilot enough to appreciate what a ship could put up with. Given lots of ceiling and a zippy machine, Art could whirl with the best of them. But with a heavy freight job like the Fairchild—well, it just didn't seem like Art.

There followed some days of enforced idleness for Jim. Dupuis, with the assistance of a couple of garage men, began the work of dismantling the wrecked plane. Jim was on the point of going out to see how the job was progressing, when he received word that Superintendent Griffin of the Mounted Police was asking for him. Jim dropped around to the police headquarters, and was at once shown into the O. C.'s private office.

Griffin was an elderly man, grown grizzled in the service of the force. He waved Jim to a chair and closed the door behind him. Then, taking a seat at a desk, he began to speak abruptly.

"Of course, Brett, there's no need to point out that this little chat is confidential. What I want is your honest opinion. Do you believe that the wreck of your Fairchild was either an accident or the result of Art Nelson's stunting?"

Jim returned Griffin's deliberate glance. "To tell the truth, superintendent, I don't know what to believe."

"The fact is," went on Griffin, "the aviation inspector can't find any real cause for it, and is prepared to put it down to unexplainable causes. We might, too—if Pete Lester wasn't in the background of it all."

Jim frowned. "Pete Lester?"

"And it's here that the confidential part comes in. You don't know it, but Lester is living under an alias. His real name is Philip Branton. And Philip Branton once served a five-year stretch in Stoney Mountain for embezzlement. That for one thing. Another: we've ways of dipping into a man's financial standing; and we've made the discovery that Lester is sailing perilously close to the wind. If our information is worth anything, he has been using his clients' funds for some of his own speculations, and right now is facing a heavy shortage. Get it?" asked Griffin. "If it

comes to a show-down—if Lester is picked up again—his old past will face him and he'll find himself put away for a lot longer stretch than another five years."

Jim Brett chewed on the facts. "And you think—"

Instead of answering the question, the officer asked another.

"Didn't Lester tell you that he has a mineral claim somewhere in the North? That he wants you to fly him to it soon? Yes; well, we're wondering how he came by it. Lester, y'know, is no mining expert; the stock market is his racket."

"Then you think that, somehow, Lester was responsible for the crash?" asked Jim.

The officer shrugged. "It's a hunch, if you like to call it that. We're given to understand that Durant told you he had a map on him at the start of the trip, a map that wasn't found on him afterward. Our belief is that at some time and by some means, Lester gained access to this map, made a copy of it, and then stole the original after the smash. The only thing that bothers us is how he managed to commit this second theft."

"That was the easiest part," replied Jim, promptly. "I left him at the wreck while I phoned Pennerton. Gave him the chance he must have been looking for."

Superintendent Griffin thudded his fist to the desk. "Our one weak link! Mind you," he went on, "I'm quite persuaded that Lester thought that he alone knew of this map; and also, that he thought the crash would mean a fire—a fire that would destroy the original. As it is, we've an edge on Lester that he is ignorant of. That's the fact that we know Durant had a map with him, and that it was stolen after the crash."

Jim was silent for a few minutes. "Durant would have to have a map for Art's benefit. Dan could possibly find his lake again from the ground, but he'd be lost in the air. I figure that he got hold of an air map some place, marked the spot where he intended to stake; and meant, later, to give it to Art once they were in the air."

"That seems logical," agreed Griffin. "But there's one more point: Supposing Lester wished to wreck the plane, he certainly did not do it himself. And that's where the mechanic, Dupuis, or the cook comes in. These two would have had access to your ship while you were waiting around the camp for Durant and McGillvray to come out from town. Do you suspect either or both of them?"

Jim was frowning bleakly. "Don't worry about the cook. Old Joe's one of the best. But Dupuis—" He pursed his lips. "Dupuis hated Art. Y'see, Art was a qualified pilot, but he did the mechanic's job rather than sit around.

That was when Tommy Curtis was flying ARO. When Tommy quit, Art got his job—a job that Dupuis figured was coming to him."

Griffin nodded with satisfaction. "We begin to grope our way out of the fog. All we have to do is watch Dupuis, and if we ever get the drop on him, make him talk."

"Failing that, you're lost," pointed out Jim. "If Lester puts up a good yarn about how he came into possession of this claim he says is his, you've only got circumstantial evidence to go on."

"Don't I know it!" replied Griffin. "Still, we'll grope along, and hope for the best."

Strangely enough, when Jim went back to the Airlines office Pennerton told him that Lester was anxious for the flight North.

"When can you start?" asked Pennerton.

Jim gave the matter cold thought. "Right now!" he suddenly exclaimed. "Mebbe the sooner the better."

Pennerton studied him closely. "Anything up? The crash on your mind? If you're not sure of yourself yet," he suggested, not unkindly, "stall for a few days more."

Jim gave a tight little grin. "I'm sure enough of myself," he replied cryptically. "But not so sure of the others." He went on to tell Pennerton that he himself would leave for the base immediately, and suggested that Lester arrive at Clearwater within an hour or so. "I want to check the plane over before I start. Yeah; tell him to come out in about an hour."

More uneasy than he would care to admit, Jim drove himself out to the base at once. He wanted to see Dupuis; wanted to be sure that the plane was properly serviced before the flight. Naggings filled his head; whirling suspicions. If the hunch of the police was worth anything at all, Dupuis was the keystone of the whole mystery. Dupuis—with his saturnine face and surly manner. Dupuis, who hated Art Nelson—

But Jim was never to speak with the mechanic again. Five minutes before he reached the base, Dupuis had blown his brains out with a .30-30 rifle.

The cook and the two garage men were at the bunk house as Jim pulled in, driving his car. The cook swung around, wide-eyed, and gave his story.

"I was peelin' spuds when the gun went off. Come runnin' here, and find him like he is now."

Dupuis was slumped across his bunk. A powder-blackened hole showed in his right temple, from which welled a thin stream of blood. Grim-faced, Jim turned to the cook.

"Any reason for this? Seem all right to-day?"

"Yes, and no," hedged the cook. "Moody, kind of. And I ain't surprised.

The way them government guys been third-degreed him, anybody'd crack up!"

The two garage men gave a similar opinion. Jim grunted. "Look here," he said. "There's been enough death and killing around this camp to last me all my life. Moreover, a passenger's coming out within the hour to fly North with me. We'll leave Dupuis as he is, and we'll all keep our mouths shut till I take off. After that, phone town and notify the police and Pennerton."

The men agreed, and Jim covered the dead mechanic with a blanket. He did it in sudden silence; for he was already mulling over this new development of the case. What had caused Dupuis' death? Remorse? Growing fear? It could not be another "accident." Then Jim shook himself out of his abstraction. Dupuis' death was a matter for the police to look into. He had his own job to do.

The plane he found to be already serviced, and he gave her a preliminary warm-up run. He remembered, then, Art's complaint about the heater. If the heater off FAB was not too badly damaged, he might transfer it to ARO.

A road had been cut through to the scene of the crash. The broken plane had been hauled, piecemeal, down to the rear of the workshop. Jim spent half an hour burrowing into the debris before he turned to the garage men.

"It's all here but the exhaust. Seen anything of that?"

They had not. And once more Jim searched. Convinced at last that the exhaust had not been transported with the rest of the plane, he returned to the bush and the scene of the wreck.

Here were still some pieces of fabric and broken framework, but no sign of the missing part.

"Funny," grunted Jim.

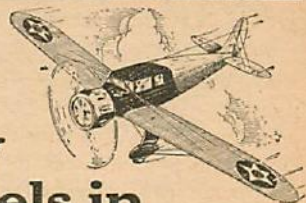
But leading away, footmarks showed in the light snow. Jim followed them. A hundred yards away they suddenly ceased; retraced themselves. Still frowning, Jim went a bit farther—and came on the exhaust pipe deep in a tangle of willows. Muttering over something he failed to understand, he carried the thing down to the workshop and got out his tools.

Inclosing the exhaust and secured to it by a collar and bolts was a larger sleeve. This was part of the heating system on the wrecked Fairchild. Cold air, drawn into the sleeve, would be heated by the exhaust pipe before discharge. This heated air would in turn be drawn into the cabin of the plane. Jim took a wrench, loosened the sleeve and slipped it back. This was the needed part for the other plane; but Jim forgot all about that. Hard-eyed, he stared at the exhaust.

Two holes had been drilled into the pipe.

Motionless, Jim stood there, sudden

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realization dawned on him. Now he knew how the plane had been wrecked. With the air, carbon monoxide gas had been forced into the Fairchild's cabin—poisoned gas, fumes of death. Neither Art nor his passengers would be aware of it until they reeled senseless in their seats. After that, uncontrolled, the plane had roared to her doom.

Minutes went by. Then from outside the workshop came the sudden blast of a motor horn.

Pete Lester had arrived for the flight.

He came in a hired taxi, bringing with him a pack sack, a grub box and his usual wheezy good humor. Meeting him, a sudden savageness swept Jim's heart, a lust to kill that he had never before experienced. Something told him that though the actual sabotage had been the work of Dupuis, the idea must have originated with Lester. Dupuis hated Art; but that of itself would not have been enough to kill two other men as well. Then he heard Lester speaking.

"All ready to go?"

Jim shook himself. "Ready an hour." He grabbed his own pack sack and grub box and turned so that Lester might not see his face. Five minutes later, with Lester aboard, he swung the Fairchild toward the Narrows and gave her the gun.

They took off, circled and climbed. The panorama of the North began to flow beneath them—forests and burned-

over hills; black ribbons of rivers; ragged gray disks that were lakes. It was cold; rim ice would be forming in sheltered coves. Silent and grim as the country itself, Jim struck a bee line for the Churchill. They passed an occasional fur post and, after an hour and a half's flight, the workings of the new gold field. Twice Lester tried to make conversation, but Jim ignored him. Then suddenly Lester produced a map.

Jim recognized it for what it was—a section cut away from one of the government air maps. It showed the Churchill, the country beyond, and the southern shores of Snake Lake. Jim, studying the thing, asked himself if this was the actual original of Dan McGillvray's, or was it one similar? He caught the name Snake Lake. He'd have given a lot then to have asked Dan McGillvray's widow if the lake that old Dan had mentioned was called Kinnipik Lake. For that was its Indian name—the name by which it was known to every one but the government map makers. But Lester was speaking again, tapping Jim on the shoulder.

"Here you are; see?" He jabbed with a heavy forefinger at a red cross and a notation on one of the points on Snake Lake. "White quartz. That's her—the cross. We'll come down on the point, run the lines and get away as soon as we can."

Jim permitted himself a curt nod; and when they were over the spot he came down in a wide circle. Then he roared in to shore, cut the gun, and eased back in his chair.

"And that's that. Pile out!"

Jim was no geologist, but he had seen enough of the North to recognize raw gold when he saw it. A half hour of grubbing with the prospector's hammer, and Lester uncovered a vein of yellow metal running through the white of quartz and back into the bush. Lester gave a hoarse yell.

"Boy, the real thing! And richer than the treasury!" He pulled out a leaflet from the pocket of his mackinaw and, for Jim's benefit, read aloud the staking regulations.

"Go ahead then," grunted Jim. "Me for something to eat."

Pete Lester's face, more red under the stress of excitement, showed incredulity.

"Eat? Who wants to eat with all this gold in sight?"

Jim shrugged. "It isn't mine to get in a lather about. It's yours—or isn't it?"

Something like a cloud of doubt crossed Lester's face, then he laughed aloud.

"Darn right she's mine! And you can eat for both of us."

Jim went up in the bush, kindled a fire and hung over it a kettle. He brewed tea, cooked bacon and set out dishes on the lid of the grub box. But before he started to eat he put a hand

inside his coat and pulled out the three photographs that Dan McGillvray's widow had given him.

Jim Brett looked at them; at a dead spruce that leaned over in the foreground. There was a spruce on this point he was on. He glanced around; and when he heard Lester chopping and hacking some distance deep in the bush, he quit the point and went down to the shore.

He moved along, shifting his position by reference to the snapshot he held in his hand. Then a grunt of grim satisfaction escaped him. Beyond the slightest doubt the point from which the smoke of the fire curled upward was identical with the photograph. There was the spruce; an outcropping of rock. There was the same bunch of straggly willows down at the edge of the lake, and the same blur of an island showing beyond the point in the far distance.

Jim slowly replaced the photograph in his pocket and returned to the camp.

But as he sat down to eat in front of the fire, Lester joined him.

The man's face was streaming with sweat. "Harder work than I thought," he puffed. "I'll take on a bite, then maybe you'll give me a hand."

Jim maintained a frigid silence. Lester looked at him sharply.

"Anything on your mind?"

"Just my cap. Eat—before it freezes in the pan."

The country was parklike, covered sparsely with pine and a few spruce. There was little labor entailed in running the regulation boundaries. Two hours saw the completion of the work and the westward swinging of the colorless sun.

"Think we can get back to-night?" asked Lester.

"We can, if you'll chance a night landing on Clearwater."

Jim, grim in his flying parka and boots of trimmed sealskin, watched Lester at his last piece of work—the erection of the discovery post.

"Get your name all thought out?" asked Jim.

Lester straightened. "Forget all about that. What'll we call the thing?"

Jim pondered, till a hard little smile played about his lips.

"How about 'Journey's End'? Seems kind of fitting, to me."

"That's a good one," approved Lester. "We'll call it that."

He turned again to the discovery post, sprawled thereon his name and the dimensions of the ground inclosed by the boundaries. Then he added the name of the claim itself: *Journey's End*.

"How's that?" he asked Jim. "All legal and secure?"

But Jim was not with him. In the cabin of the Fairchild, he was buttoning his parka, still smiling grimly.

Ten minutes later they took off. Jim clawed his way to eighteen hundred feet;

headed south. Forty minutes of flying and the hills came into view beyond which stretched the Churchill. Jim, sniffing sharply, suddenly turned in his seat to face Lester.

"Smell anything?" he asked. "Funny!" He sniffed again. "Fumes of some sort—like monoxide. Wonder if that exhaust's sprung a leak?"

Jim was watching Lester like a hawk—and so saw the fear that clutched him.

"Eh?" blurted Lester. "Monoxide? Then for Heaven's sake, get her down!" He rose from the chair, his face now ashen-hued. "Down, you fool! Get her down!"

Jim gave a sneering laugh. "Don't you know there's no smell to monoxide? But the mention of it made you think!"

Lester stiffened. He tried desperately to control his features; even tried to pass the matter off as a joke.

"Sit down!" barked Jim. "If a judge and jury could see you now, they'd hang you on sight. Sit down!" he rapped again; "or I'll heave you out the door!"

Lester obeyed, but now that the first shock of his fear had passed, his eyes hardened. There was a hint of cunning in them. Handling the ship more by instinct than by direct navigation, Jim went on:

"Know what I should do with you? Take you to town and see you hanged for the killer you are. But I can't do it—and you know why. I can't prove a thing!"

Lester licked his lips; studied Jim intently.

"That don't mean to say you're getting away with it though," Jim continued. "You sent three good fellows crashing to their deaths—and you get the same!" He suddenly stood up, shook the parka from his shoulders and displayed a parachute harnessed about him. "I'm bailing out!"

For a moment, the full import of Jim's threat was lost on Lester. Then, suddenly, he began a broken chatter.

"You ain't—got a—thing on me! I—don't know what—you're talking about!"

Jim set his jaw and forced his bluff. Holding the stick with the tips of his fingers, he began to back away from the controls.

"O. K. with me. You, Art, Dan and Ed—all going the same way home!"

"You wouldn't do it!" screamed Lester. And then: "No, no! Not that! We'll fix it—you and me—"

Jim relaxed, slid into his seat again. "What you mean—fix it?"

"Cash. Money." Lester swallowed with difficulty. "What's it worth?"

A feeling of disgust swept over Jim Brett. Did this—this rat think that men's lives could be bought?

"There's just one thing that'll fix it!" he roared. "And that's the inside story of the whole business! In writing—signed—ready to be handed over to the police."

Lester stared at him, as though doubting his ears. "You want me to put a rope around my neck? You might as well jump and let me get it over like that!"

Jim made a rapid decision.

"You don't deserve it, but I'll give you a break. Write me the inside yarn, and I'll turn you loose to work out your own salvation. In other words, I'll land, give you grub and blankets and allow you a twenty-four-hour start before I notify Superintendent Griffin. That's the offer. You can take it or leave it—quick!"

Lester ran a tongue along his dry lips. There was no color to his once florid face. It was gray, dreadful, the face of a living corpse. But he capitulated.

"I'll get some paper. My pack sack is—"

"Here you are!" Jim grabbed the log book from the side pocket. "Do your stuff, and do it fast!"

The pencil shivered in Lester's hand; the writing itself was a jumpy scrawl. Jim took the paper at last, read it. Dividing his attention between the course of the Fairchild and Lester behind him, he folded the paper and placed it in his parka pocket.

"So you bought Dupuis, eh? And you didn't know that any one but old Dan and Ed Durant were wise to the map part of it. You're good!" mocked Jim. "Well—here goes!" And Jim went down in a tight spiral, making for a little lake that lay immediately beneath them.

The floats touched the water; the plane swung and nosed to shore.

"Out you go!" said Jim.

With the motor idling, Jim looked around. There were the towering spruce-clad hills, limned by the sinking sun; the steel-cold dome of the sky. The very country echoed its bitter aloofness. Death for a greenhorn like Lester— He turned in his seat again—and numbness gripped him.

Lester was standing in the doorway, hard-jawed. A blunt-nosed automatic in his hand pointed straight at Jim's head.

There was a short, harsh chuckle. "Ain't you good?" grated Lester. "D'you think for a minute I'd sit in a game like this without an ace in the hole? I had it—this gun—but it was no good up there!" He chuckled again, his eyes black with hate. "Strip that 'chute!" he suddenly barked.

Jim realized the desperate nature of the situation. Lester was a killer by nature; he had proved that in the crash of FAB. And being a killer, his only salvation lay in killing again. If Jim had any hope of coming through alive, it would not be by forcing Lester's hand. The 'chute came off.

"Good. Let's go!"

Teeth clenched, Jim met the situation by gunning the motor and taking off.

One thing alone gave him courage. He did not know Lester's plans, but once he had gained altitude, he could sit back and dare Lester to do his worst.

But at eighteen hundred feet again, he heard a movement behind him. He turned—and his blood froze. Lester was snugging the parachute about him, and the gun was still in his hand.

The man met Jim's gaze, grinned wolfishly.

"I've traveled by air before. Worn these things, too." He gave Jim a sharp command. "Higher yet!"

Once more Jim obeyed, though fighting for the chance loophole that seemed denied him. If he put up a scrap, Lester would drill him and jump. If he submitted without a struggle, Lester would probably drill him and jump, anyway.

Lester was speaking once more. "It never did pay to horn into the other fellow's game. We'll keep on drifting till we get within a few miles of the gold fields. What'll happen then won't concern you. But when I reach the camp and tell 'em the story of the wreck—tell 'em how you made me wear the only 'chute aboard when the engine cut up—you'll be the little hero!"

Jim chanced a look over his shoulder. Lester was beside the door, the door a trifle ajar. Lester was waiting for the next few minutes to pass— The gun was tightening in his hand.

Jim, counting himself on the lip of eternity, clutched at straws. There was a fire extinguisher not three feet from his side. Could he reach it—hurl it? He banished the thought. Before he had lifted a hand, one of those heavy automatic slugs would crash through his brain. Then—

SEE 'EM and LEAP!

(Answers to photos on page 25)

The FISH: Inverted nose views of a Douglas DC-2 transport.

The MULE: Rear view of a B17L Beechcraft.

The SNAKE: Tail view of a Lockheed Electra transport, showing tail wheel and dangling radio antenna wire.

The SPIDER: View of retractable landing gear wells of the B17L Beechcraft.

Inspiration. A flash of it. A thousand-to-one chance!

He kicked right rudder, slued the Fairchild in a crazy bank. Came an oath from Lester as, off-balance, he fought for a foothold in the suddenly sloping doorway. Jim ducked—grabbed the extinguisher and hurled it at Lester's head. There was a thud as the missile found its mark. A choking sort of grunt. Then the slam of the door as it closed again.

Engine yelling in protestation, the Fairchild held her pitch as Jim stared through the canted windshield.

Lester was going down—down. His arms and legs spun like a pinwheel. But there was no blossoming of the 'chute; no checking that whirling fall. The figure shrunk, became a speck against the gray lake. But his line of fall carried him gradually beyond it. The speck plummeted toward a low, snow-mantled point that jutted treeless, into the gray expanse. Then there was a puff, as of spray shooting aloft—

The whirling ceased abruptly.

Jim was trembling as he pulled the Fairchild onto her course again. One more glance at that unmoving figure, now a still, black dot, and he nodded, grimly, to himself.

"I guess you were right—Journey's End."

But cruising alone in the clear sunset air of two thousand feet, Jim sank into a thoughtful mood. For a gold claim, men had died. There were Art Nelson, Ed Durant and old Dan McGillvray. Good guys, these. Then Dupuis, another Judas who had found his price too small. And Lester, killer and crook. All called to their death by the lure of the yellow metal. Jim's thoughts ran on. He would stop at the new gold camp on the Churchill and spend the night there. He would notify Constable Shelton of the happening, then on the morrow head in with him to recover Pete Lester's body.

There was one more thing to be done: Names were to be changed on the mineral strike to the North. "Journey's End" would be obliterated; so would the name of Pete Lester. With his own hand, Jim would write that of the new owner—"Larry McGillvray."

Jim's mood softened. Up there in his empire of space with the sun-tipped hills before him, his thoughts linked together Art Nelson and young Larry. They were alike in many ways—laughing, cheerful, full of that element that men called guts. Now there was another bond between them. Jim voiced it when he heard himself speaking aloud:

"You'll never fly again, Art old man; but I know a kid that'll walk. That O. K. with you?"

And out of those empty spaces Jim thought he heard the voice of Art Nelson answering him:

"O. K. with me, did you say? I'll tell the cockeyed world!"

THE GRUMMAN NAVY FIGHTER

(Continued from page 27)

the navy and the coast guard, and is as far as I'm concerned, the cleanest and best-looking small amphibian yet produced.

The painting on the cover shows the latest design turned out by the Grumman Aircraft Engineering Corporation, built in their Farmingdale, L. I., factory.

It is a high performance single-seater pursuit plane powered with a Wright two-row Whirlwind motor of 650 h.p. The ship is of the single bay, staggered biplane type, with fabric-covered wings of unequal span, strongly braced with "N" struts and streamlined cross wires.

It is equipped with fully retractable landing wheels and swiveling tail wheel of the standard Grumman type. The retracting mechanism, operated by both engine and hand-driven gears, folds the wheels upward and seats them in recesses sunk in either side of the fuselage just forward of the lower wings.

The pilot's cockpit is set well aft of the wings in a position affording the best possible visibility. It is covered with a sliding transparent inclosure which adds materially to the streamline flow of the fuselage. Twin machine guns are mounted on either side and immediately in front of the cockpit within easy reach of the pilot's seat. The ammunition boxes are concealed by hinged metal side panels and are easily accessible to the ground crew for rapid reloading.

The tail surfaces are of the usual Grumman design, braced with rigid diagonal struts.

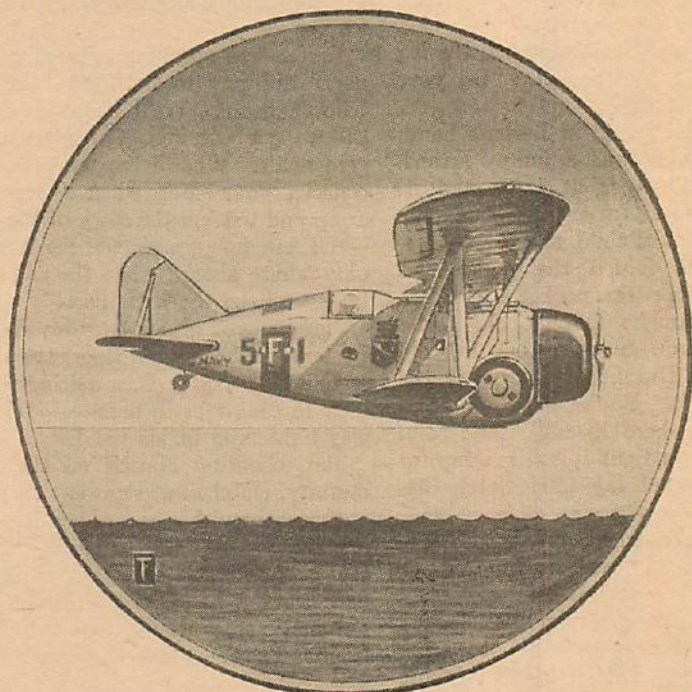
The ship is fitted with a complete set of instruments, ammunition counters, landing flares, arrester gear and safety equipment.

While the performance details of the new fighter are, of course, shrouded in secrecy, it is known that she will hit at least 265 m.p.h. This is largely due to the highly effective job of streamlining done by the Grumman designers. With the wheels retracted, the plane assumes the "tear drop" form that has been so widely discussed by automotive engineers during the past few years.

This theory of streamlining is almost directly opposed to that used by the English in designing the famous Hawker Super Fury. It is interesting to note that both ships develop about the same

speed with approximately equal horsepower. This is really a triumph for the Grumman Corporation, as they have succeeded in building a ship that combines the tremendous strength requirements of the U. S. navy with a speed equalling that of a foreign plane which is practically a beefed-up racing job.

With squadrons of these rip-snorting little fighters crowding the flying decks of the biggest and fastest airplane carriers that sail the seven seas, Uncle Sam's navy may well be proud of its ability to boast "the finest naval air service in the world."



The streamline shape that gives the Grumman its speed.

AIR MAIL ACES

(Continued from page 20)

Fork Country Club and ordered to place their cars so that their headlights marked the widest strip of level turf available.

Freddie McHugh saw it and was amazed, but he took a chance and glided in for a perfect landing as the idling Liberty sputtered its last gasp.

The mail went through—on a train to Newark, the next morning.

All the old air mail adventures, however, did not turn out so well. Captain Leonard Brook Hyde-Pearson was caught in such a fog at night over the Alleghenies while trying to get through one of the slots in the air trail. He missed and smashed full tilt into a mountain before he could yank back the stick. In his pocket they found a prepared letter which read:

TO MY BELOVED BROTHER PILOTS:

I go West, but with a cheerful heart. I hope that what small sacrifice I make may have been of use to the cause. Stick to it, boys. I'm still very much with you all. See you all again. HYDE-PEARSON.

Air mail flying had its humorous side, too. Dean Smith, a well-known pilot, once sent in a report that for brevity and detail, is one of the finest bits of aviation writing in literature. It went like this:

Dead stick. Flying low. Only place available, on a cow. Cow killed. Plane wrecked. Scared me. SMITH.

Kenneth Unger, a Quiet Birdman pal

of mine who runs a flying school at Westfield, New Jersey, once flew the air mail and lived to tell it. Ken has a rare sense of humor that perhaps got him by. He was forced down one day out on the plains and his eventual report explained his adventure as follows:

Forced landing. Borrowed a horse. Over-controlled, her nose went up and I spun (or sideslipped) into the ground. Ankle broken. Should have fixed safety belt before taking off. UNGER.

What really had happened was that Ken had tried to get his mail through via horseback, but his hair-raising style of horsemanship was not appreciated by the nag they lent him. So they strapped his ankle up, furnished him a

pair of crutches, and got him back to his ship. Then they nailed a loop of leather over the rudder bar and with his good leg he managed to take off again and get his pouches into Elko. There he went to a bone-setter and had his own undercarriage repaired.

Pilot Westley Smith, an old-timer on the early mail runs, is credited with re-vamping the old D.H. 4 and making her more airworthy. It will be remembered that the old Liberty had a nasty habit of catching fire in the air, mainly because the original feed line ran directly over the red-hot cylinders and exhausts. A little undue vibration, a broken feed line—and the fuel spilled on the pipes and it was all over. Smith had an experience of this sort one night, but he got down safely by sideslipping all the way to keep the flames clear of the wings and then set her down. Smith revised the fuel line and induced the officials to move the undercarriage several inches forward, which prevented many overturn landings and resultant flammings. This ship was then known as the D.H. 4B.

The old Curtiss Jennies that were also used in the early days gave their pilots plenty of trouble, owing to their rare lightness. While flying the mail between New York and Washington, Lieutenant J. C. Edgerton once hit a line squall somewhere south of Philadelphia. He was at 4,000 feet when it struck and was hoiked to 10,500 before he cleared. But he got through.

The weather played rare pranks. Flying a D.H. 4 from Cleveland to Chicago, Pilot Harris hit a Midwestern tornado. He was rammed into a cloud so black that it was impossible to read the instruments on his board for more than an hour. He flew on, not knowing where, but he eventually dropped out of it over Grant Park, Chicago, in blinding sunshine!

Paul Collins had a shaky time one night flying east from Bellefonte in the heart of the Pilots' Graveyard. The weather was bad, very bad, but Paul had seen worse, so he continued on. He watched his instruments and knew he was well above "the hump." But imagine his amazement and terror when, at 12,000 feet, he suddenly came upon something large, gray, and bulky. He squinted and stared again and then yanked the stick back and leapfrogged over the U. S. airship *Shenandoah*, which was out on a night trial. That will give you an idea of how long ago these amazing air mail incidents took place. He had come upon the big navy airship from an acute angle so that her riding and navigation lights were not visible. It required the rest of the trip to calm his jerking nerves, but the mail went through—almost through a dirigible!

A pocket pencil, a small gold affair, once saved the air mail. Pilot Lowenhardt was hammering along at about 5,000 feet with a hefty load of registered. He drew the stick over to get

back on his course after shooting through a slot in the mountains and was amazed to find that the stick had come free in his hands. He was caught cold, with no control over his ship except the rudder, and that was like riding a tiger without reins.

For a minute or two he considered bailing out, but his flying instinct told him to examine matters first. Bending, he looked at the socket and saw that the pin that held the stick had sheared off and slipped out. As he bent over again to check the damage further, a small gold pencil slipped from his coat pocket.

Pilot Lowenhardt stared at the pencil. Then with a broad grin he picked it up and inserted it in the open hole. The stick held! And the mail went through.

But Lowenhardt growled on landing that the pay was not high enough to provide a gold joy-stick pin for every flight.

The war provided wild adventures, and the men who pioneered in early aviation had their thrills, but no chapter of aviation will ever equal the mad years when the air mail was spreading its wings. It has passed now with modern air lines, radio compasses, beacon lights, and 200-mile-an-hour transports, but those who went through it will never forget the anxious hours of pounding through the foggy night with their loads. For in spite of wind, rain, and weather, the mail had to go through—and it did.

THE MODEL WORKSHOP

(Continued from page 36)

about 3" from the rear. The rudder is cemented to the top of the fuselage.

PROPELLER CARVING

Material: 1 balsa propeller block 15x13 $\frac{3}{4}$ x16", wire propeller shaft, small piece of brass for propeller guard-washers.

The propeller drawing shows how the block is shaped before the actual carving is begun. Lay off the block with pencil and ruler, punch a hole straight through the center with a needle and then cut away the excess wood.

In carving the propeller use a sharp knife. We've reminded you about this almost every month, but it is important. When carving the propeller, hold the block in your left hand and rest the end of the block against your chest, holding the knife in your right hand. Cut thin slivers; never try to speed up the process by cutting big chunks of balsa.

When sanding the blades, start with coarse sandpaper and work out the rough spots. Fine sandpaper is used

for the final sanding. About $\frac{1}{8}$ " of camber, or curve, is put into the propeller blades. Wrap the sandpaper around a circular object and in this way sand the camber into the back surface of the blades.

Don't hesitate to cut the blades of the propeller to $\frac{1}{8}$ " at the hub and $1\frac{3}{32}$ " at the tips. The propeller will last just as long if the blades are flexible. Remember a propeller is never broken beyond repair. I have used propellers which had been broken at the hub or at the middle of the blade which delivered as good a flight as a new propeller. When mending a propeller, however, be careful to retain the original blade pitch.

Very often the tips of the propeller blades become "chewed" from landings or take-offs on rough ground. Cut away the damaged section and cement a new piece of balsa in place. Don't cut this balsa to shape until the cement has dried. Then cut it to the correct thickness and round the edges. You'll barely be able to distinguish between the re-

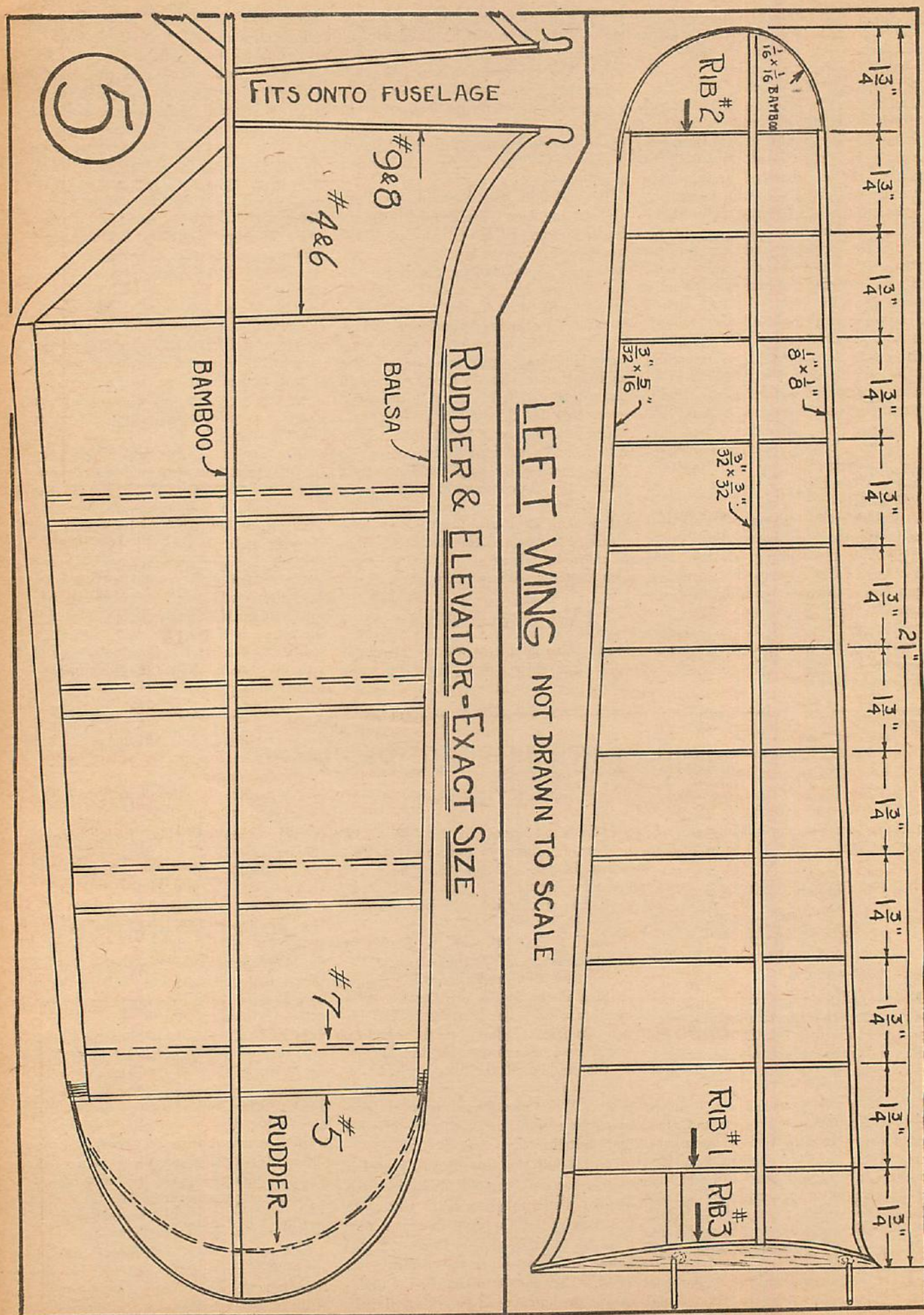
paired section and the original part of the propeller.

ASSEMBLY

In gauging the wing and elevator settings, we will consider the side-center fuselage longeron as being the line of thrust. All measurements will be taken with this line as zero. The wing setting which we found to be the most efficient was: front of end rib 1" below the thrust line, rear 2" below the thrust line. The tip of the wing does not have this same setting, since the wing is given washout. That is, the tips are warped down. By moistening the wing and twisting it while it dries, you can add washout. At the center the wing should be set at quite a high angle which gradually tapers out as you approach the tip. The angle at the tip should be just a little above zero or neutral setting.

Setting the wing with less incidence at the tips than at the center is an efficient set-up. The usual wing-tip drag is reduced greatly without a loss of lift.

The elevator is set so that the leading



edge is about $\frac{1}{4}$ " higher than the trailing edge, assuming the center longerons as the neutral line. You'll be able to change the elevator settings by inserting a piece of bamboo through the fuselage underneath the elevator and sliding it backward or forward for different settings.

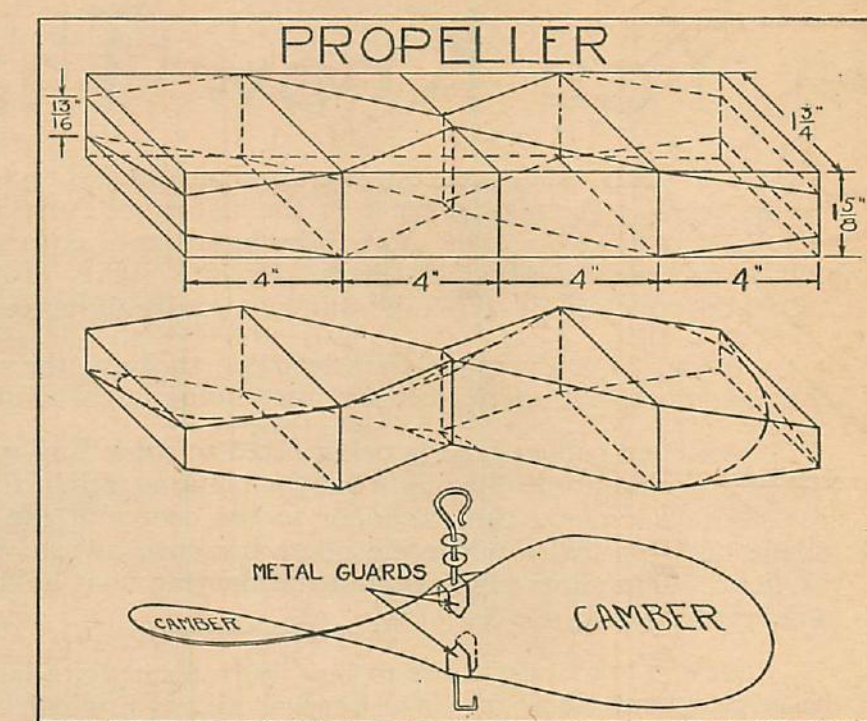
The elevator is cemented to the top rear of the fuselage in a neutral position. I found it necessary to give the rudder a slight turn to the left. However, test your model before you warp the rudder in any direction.

FLYING

The model should balance approximately at former E. If your model balances and still fails to perform, adjustment must be made in the angle of the wing or tail setting. If the model stalls, raise the front of the elevator a trifle, or lower the front of the wing by inserting the wire prong into the lower of the front tube sockets. If the model dives without attempting to climb, the probable trouble is too little incidence in the main wing. In this case remove some of the washout from the wing tips or raise the leading edge of the wing.

My Thermal Finder had a steep climb and was not sensitive to adjustments. That is, the model performed successfully through a wide range of wing and tail settings. So you shouldn't have any trouble getting a good flight. Adjust your model to fly in left circles. Warping the rudder to the left will turn the model. It might also be necessary to reduce some of the washout in the left wing—that is, raise the tip slightly to balance the model against the propeller torque which tends to depress the left wing. (The direction left or right is always taken as though you were sitting in the plane looking forward.)

You'll find this model is a very efficient flyer. As you watch it circle over-



head it will seem as though every bit of energy which you stored in the 16-strand motor is being converted into seconds of flight.

Fuselage, landing gear, and rudder	1.06 ounces
Elevator92 "
Total	3.54 ounces

SPECIFICATIONS

Don't neglect to record the Thermal Finder wing and tail settings, weights, performance, etc., in your model note book. It will be interesting to compare its performance with high-wing ships. Here are some of the data I've taken from my notebook. It will help you in building your model. When you record the specifications of your model, however, include every scrap of information which will help you to duplicate the Thermal Finder on some future date.

WEIGHTS

Wings68 ounces
Motor stick and propeller..	.53 "
Rubber motor.....	1.05 "

DATA

Wing area	174 square inches
Rudder area	24 " "
Elevator area	52 " "
Propeller area	22 " "
Propeller pitch	21 inches
Loading is 1 ounce per 50 square inches of wing area.	
Rubber motor: 16 strands $\frac{1}{30}$ x $\frac{1}{8}$ ", 30-inch length.	
Average flight in still air—2 minutes.	

If you have any trouble constructing or flying the Thermal Finder, or if you need information on any details of model building in general, write to me in care of AIR TRAILS and I will try to answer your questions here in the magazine.

Important News for Model Builders!

Next month Gordon S. Light will present the plans of his Wakefield International Trophy winner for 1935.

In winning the trophy, the model was clocked officially at 7 minutes and 20 seconds, but it continued to fly unofficially for two hours.

The Wakefield Trophy winner is a consistent performer, with flying qualities that were not dimmed by 3,000 miles of ocean voyage to England. It is so easy to fly that a British modeler who had never seen the ship before assembled it and flew it to first place against the British, Australian, French and other American entries. It complies with the National Aeronautic Association's rulings and makes a fine contest ship.

Complete plans and instructions in next month's issue will enable you to duplicate the Wakefield Winner. Don't miss this Gordon Light model! The April AIR TRAILS will be on sale at your local news stand on March 11th.

Do You Know That—

The year, 1935, according to Eugene Vidal, director of the bureau of air commerce, was the biggest year in the history of American aviation? Transport lines carried one-half more passengers and express and twice as much mail as in the best previous years. Private flying, ordinary commercial flying, and production of civil and military aircraft all increased.

About 25,000 persons were learning to fly at the end of 1935, as shown by the number of student licenses outstanding at that time?

A folded rubber boat is being fitted to some English navy combat planes that will save not only the pilots but the plane as well, if they should fall into the sea? Boxed under a thin trapdoor in the center of the upper wing, the boat inflates automatically when the plane becomes awash, breaking through the trapdoor. The pilots climb in and the floating boat holds the plane suspended under water until help arrives.

New York State hopes to buy the intermediate landing fields rented by the government along the local Federal airways, which are now restricted to emergency landings only, and lease them to the government at no cost? The immediate saving to the government, the State specifies, would be spent in paving runways so that the fields could be thrown open to regular use, thus greatly increasing the number of airports for private and general flying.

If there is any occasion in the future to use "balloon" aprons—huge cable nets hung at great height by anchored balloons spaced around London at night during the World War, to discourage bombing raids—they will be charged with high-voltage electricity? Contact with the nets by enemy airplanes will probably mean instant electrocution of the pilots.

The newest dirigible, the huge Zeppelin LZ-129 nearing completion in Germany, will be named "Hindenburg"? It is intended for transatlantic service to the United States.

Giant dirigible airships are urged as much superior to the China Clipper type of airplane for flying the Pacific? Commander Rosendahl, captain of the navy's "Los Angeles" and other dirigibles, claims that a plane takes five or six days to carry a one-ton payload on the trip to Manila, whereas an airship could carry 50 passengers and 20 tons of cargo in three and a half to four days.

In 1881, a stream of molten lava from Hawaii's Mauna Loa volcano that was approaching the city of Hilo stopped after the native princess prayed to Pele, the volcano goddess? The 1935 method was to bomb the volcano from army airplanes.

The army has been granted further funds for continuing its intensive secret experimental work on developing Diesel oil engines for military aircraft?

Japan has launched a new aircraft carrier, the "Soryu," or Green Dragon? It is a 10,050-ton vessel with 60,000 h.p. engines giving it a speed of 30 knots, or about 35 miles an hour. Its defending armament will consist of a dozen 5-inch guns. A sister ship is scheduled to be launched next year, at which time the "Hosho," one of the country's four present carriers, will be scrapped, giving Japan a total carrier fleet of five vessels.

A veil of ultra-short radio waves may be used for detecting raiding aircraft? Broadcast between strings of transmitters and receivers covering a given area, the waves will be reflected from any body moving through them, thus altering the strength of their reception and indicating the position of the interfering body.

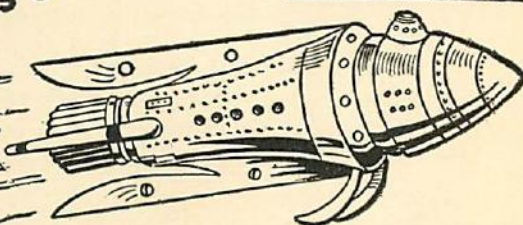
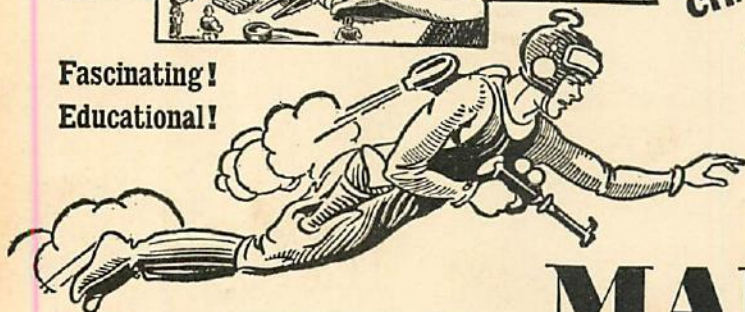
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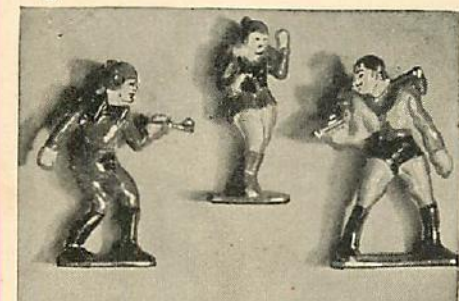
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