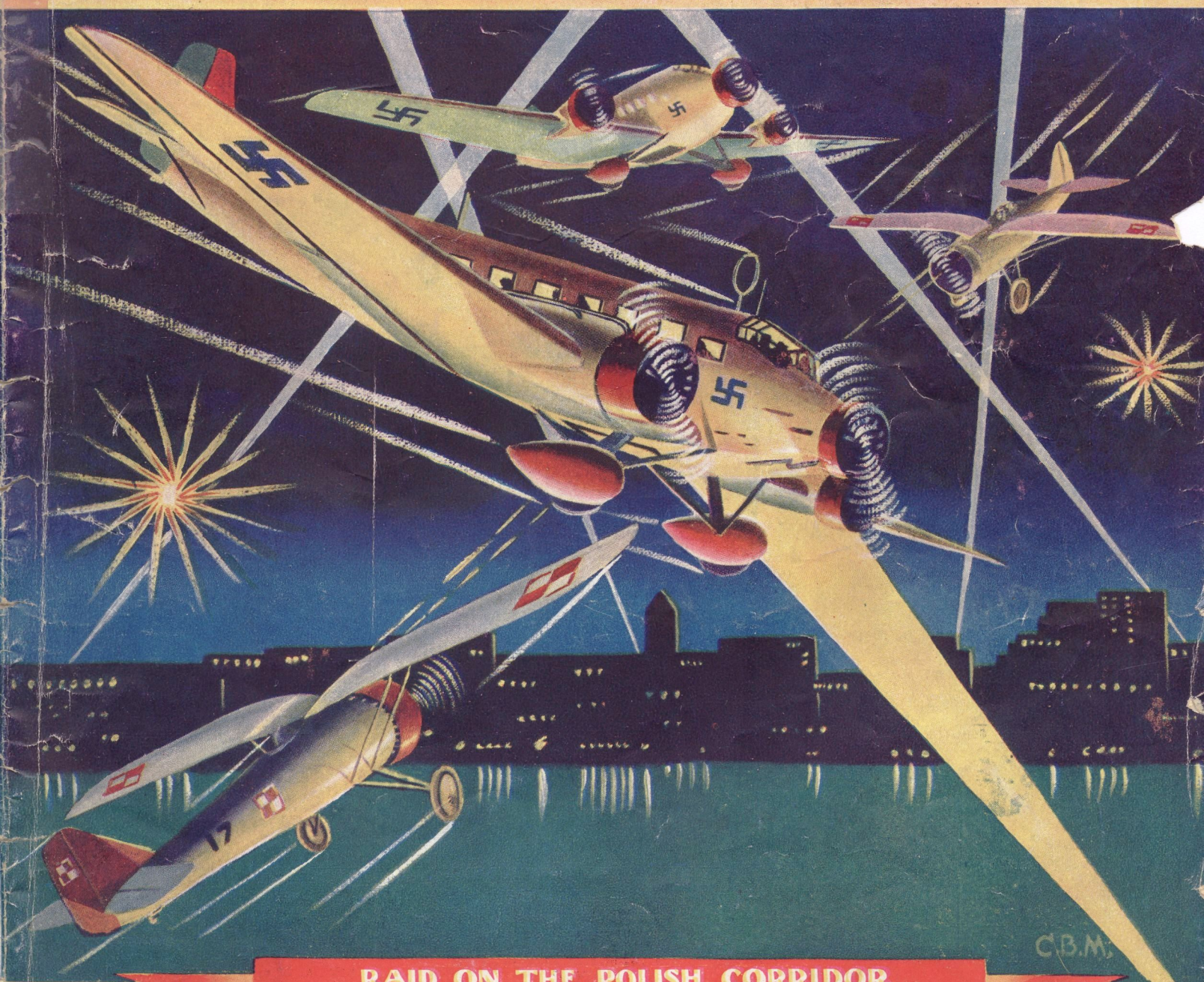


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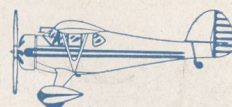
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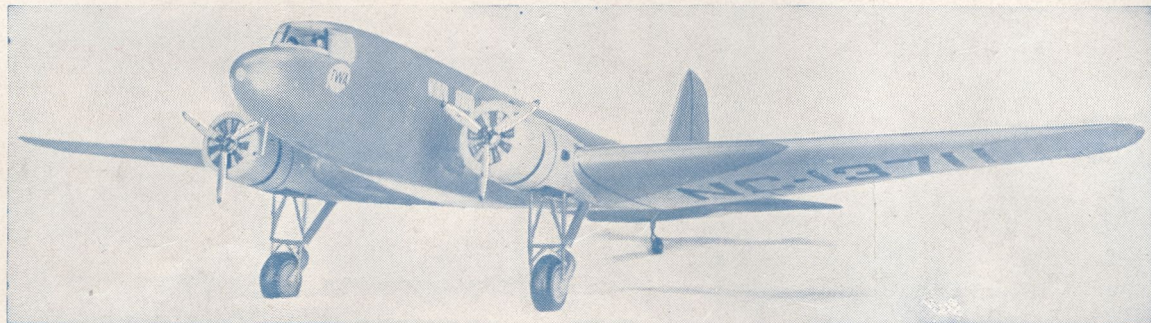
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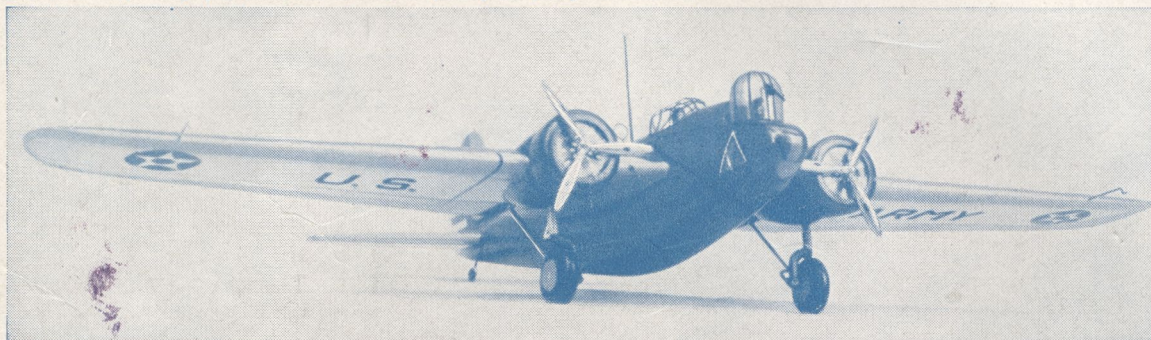
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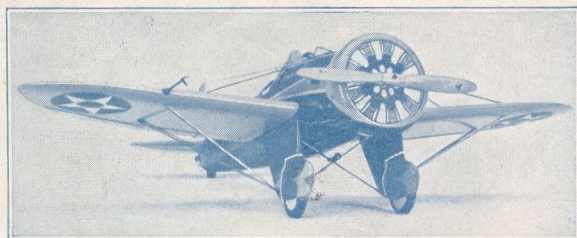
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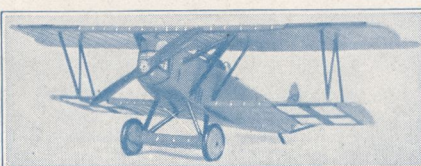
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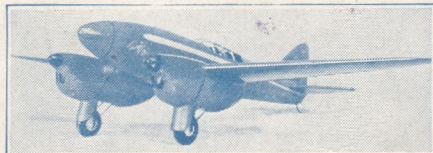
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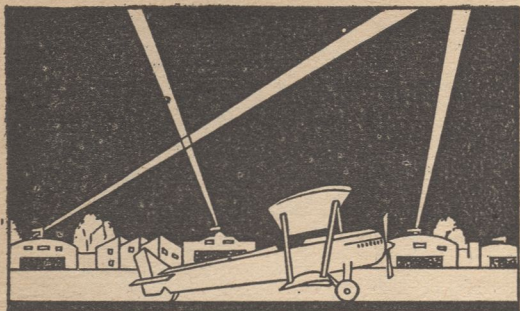
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(See Page 45)

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FLYING ACES

A.A.WYN, Editor

VOLUME XXI

OCTOBER, 1935

NUMBER 3

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Cover Painting by C. B. Mayshark

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AMAZING "PHILIP STRANGE" MYSTERY NOVEL

By Donald E. Keyhoe

Author of "Squadron of Masked Men,"
"Scourge of the Spectre," etc.



As the stricken plane plunged down, Strange tried madly to bring his Vickers to bear.
But the hurtling Dornier had screeched into a dive.

at the thought. A chance to forget that last ordeal, when von Zenden had tried to frame him with the murder of an American general. Ten days with war, espionage, and dangerous missions forgotten. From the second when the ack emmas shoved his Spad into a hangar until those days were over he would be just Pete Smith, Yankee shavetail. If G-2 tried to cut short his leave, they would find that Captain Philip Strange had disappeared into thin air.

The Spad circled lower. Strange wiped his misted goggles. The sharp green eyes back of the lenses flicked toward the luminous clock.

One minute to eleven . . .

Strange turned suddenly and stared into the night. He could see nothing, could hear no sound above the half-idling Hispano. Yet some unerring instinct, a part of his mental make-up, told him he was not alone in the sky.

Abruptly, a parachute flare bloomed out a hundred feet beneath him. He jammed his throttle open as a curious-looking seaplane whirled under the Spad. Metal wings flashed, and the brilliant light shone on the grim black cross of the Germans.

As the Spad thundered down, the metal ship curved back under the flare. Strange shaded his eyes, kicked the Spad to one side. The flare began to wane, and he saw the Boche ship dive. In the rear of the glassed-in turret, a man reached toward a switch.

Down in London, Big Ben was striking the hour.

As the switch blades closed, vivid blue fire crackled

"Strike," read the deciphered message, "precisely on the hour—Z-13." Three minutes . . . two minutes . . . one—then a bristling Dornier dived into view over London, its nose spurting a livid bolt of blue. And in the darkened city below a terrific eruption followed, hurling wreckage, dealing death! The pilot of that grim Dornier had intended to be seen—but one of those who saw was a greenish-eyed man, a man who conveniently called himself "Pete Smith."

out of the seaplane's nose. A thousand feet beneath, a terrific geyser of blue flame leaped up from the darkened city.

With a roar like that of a cataract, a building crumbled to the ground. More flames shot out, turning the night into day. By that dreadful glare Strange saw the walls of a second building sag and tumble away. Another roar came through the Hisso's thunder. A pall spread out, through which a moment later oily red flames came licking. Down in a dead-end street, a score of trapped men and women tried to fight past the

blaze. Three or four dashed into the smoke and vanished. Then a wave of fire swept out and hid the rest from sight.

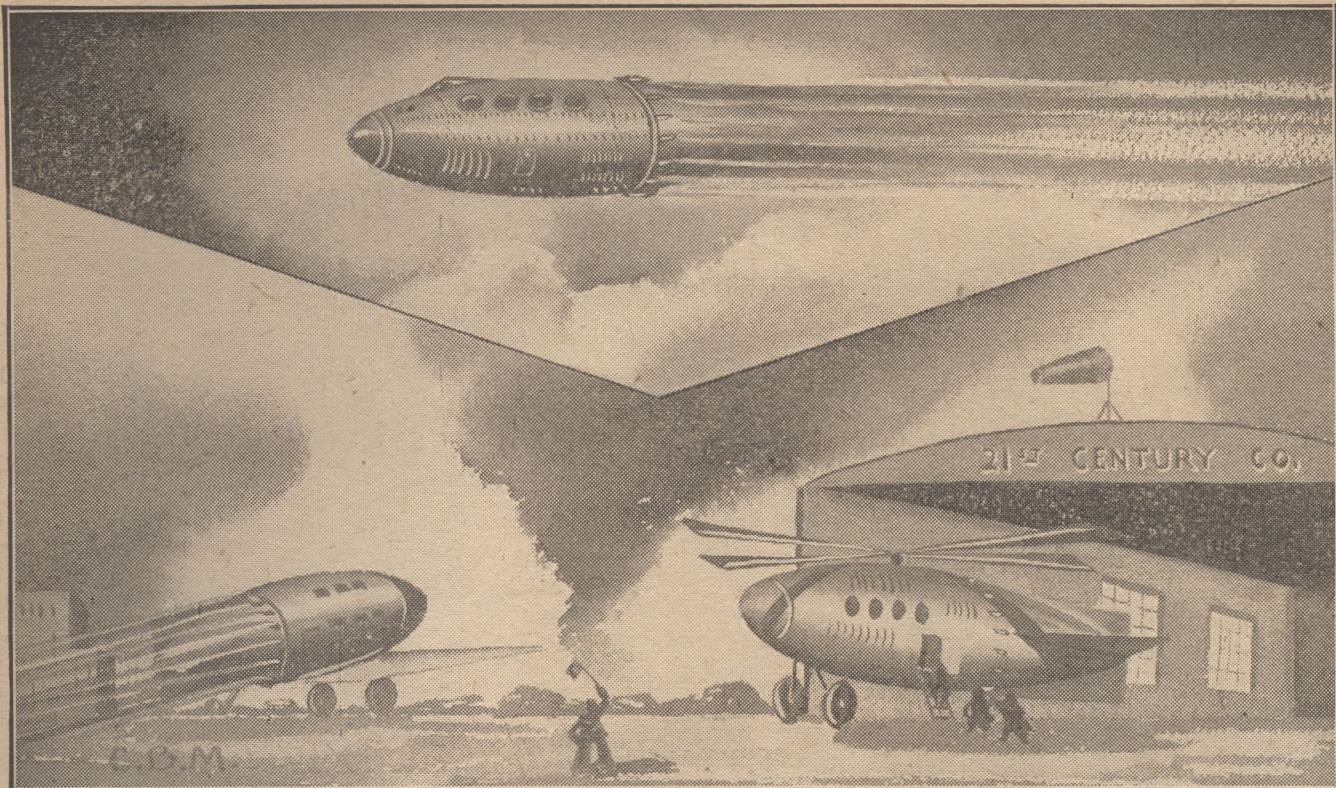
Strange tore his eyes from that awful scene. In his first stunned horror he had almost forgotten the German ship. The seaplane was zooming steeply. With a face like granite, Strange hurled the Spad in pursuit. By some diabolical means those fiends had wrought that frightful destruction below. If they escaped with that death-dealing machine—

Br-r-r-t-t-t-t-t-t-t! From the mists at Strange's back came the muffled pound of guns. A bright stream lanced past his wing. He kicked out of the tracers, swiftly chandelled. A blurred shape vanished behind the curtain of rain. Strange snatched at his charging-handle. The Vickers spat two streaks of fire into the flitting shadow.

The seaplane had almost reached the clouds. Strange backsticked, sent a vicious burst between the two pontoons. The Boche ship whirled into a vertical bank. From his post behind the motors, the mechanic-gunner hastily opened fire.

Strange rolled away from the probing red lines. The Spad gained speed, came back in a lightning turn. The Boche in the rear of the seaplane's turret jumped for his Parabellum. Flame spurted as the snout lurched toward the Spad. A hail of slugs thudded into the wing. Strange booted the rudder, then sent a thirty-round burst through the glass of the turret.

(Continued on page 44)



Illustrated by C. B. Mayshark

To aid you in visualizing the revolutionary aircraft discussed by Lieutenant Lewis, we present above a conception of the air machines of tomorrow. The top portion of our illustration shows you how a rocket ship might appear in full, hurtling flight. At the lower left, a craft is depicted taking-off, employing retractable wings and under-carriage. And on the right, we see a ship equipped with retractable rotor blades for use in take-offs and landings. You will note that our artist has dubbed his imaginary airline, the "21st Century Co." But who knows? These craft may become common in our own day.

away from the head and eyes, the pilot "goes black." He temporarily becomes blind and may lose consciousness. Racing plane pilots experience this same condition when banking vertically around pylons at high speed. The blood is also drawn from the heart. In the case of test pilots pulling up from long power dives, death may result.

Several well-known test pilots, including Vance Breese (who recently made a 16,000-foot vertical dive under full throttle in the new Northrop fighter) have tightly taped the lower part of their bodies to check the rush of blood and to keep their hearts pumping. This system would, of course, be impracticable in the case of passenger planes. Perhaps some other protective method may be devised.

However, as long as a plane keeps in straight, level flight, no discomfort is felt. It would probably be possible to travel at almost any speed if the plane did not turn, or dive, or climb abruptly. Super-speed air transports would have to be pointed toward their destinations, before reaching cruising speed, and held to this course.

ANOTHER problem would be that of accelerating and decelerating at take-off and landing. Navy pilots being shot off a catapult accelerate from zero to 60 miles an hour in the space of a few yards. So sudden is the take-off that they feel themselves being pressed violently back into their seats. They must be very careful to place their heads firmly against the headrest before being catapulted, for otherwise the sudden start would bang them backward so hard as to knock them unconscious.

A sudden take-off for a ship in the 600-miles-per-hour class would be out of the question. It would kill everyone in it. And there is no flat, level stretch of ground anywhere in the world large enough for such a plane to taxi forward and gradually gain this high speed. So far as a water take-off is concerned—if our airplane of the future could be fitted with floats—it is doubtful if there are enough stretches of water great enough in size and

at the same time sufficiently smooth for regular operations.

Here, again, the autogiro rotor blades would solve the problem. The ship could take off at comparatively low speed by using the rotor. When it gains the desired altitude and is pointed in the proper direction, the engine could be opened up. As soon as the plane reaches a speed that will support it, the rotor could be folded into the fuselage. In landing, the same procedure in reverse order, could be followed.

Now here is an interesting thing: A plane travelling at such high speeds would become greatly overheated due to the friction of the air. Modern racing planes have had their temperatures raised considerably when flying in the neighborhood of 300 miles per hour. At 600 miles per hour, and above, this friction heat would become a real problem. Radiators would have to be provided to cool the entire plane.

Some experts believe that the aircraft of the future will be built on the rocket principle, hence extensive experiments are being made with such equipment in this country, in Germany, and in Russia. In Germany, an ascent to a height of over six miles was actually made by Otto Fischer in a man-carrying rocket. No system of landing the rocket had been devised, so Fischer descended by parachute. The machine was propelled by liquid oxygen and a secret gas mixture. It is estimated that it developed 15,000 horsepower!

In this country, successful experiments have been conducted by a group of scientists at Cleveland, Ohio, using propane gas for propulsion. The work is still in progress.

Russia is making great strides in rocket development. The Soviet Stratosphere Committee recently ordered the construction of a huge rocket specified to ascend at the rate of 2,200 feet per second.

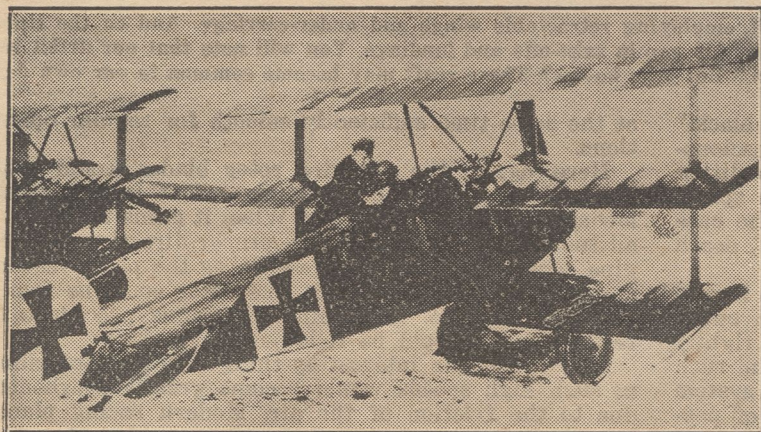
One striking possibility of the rocket, if its great power is ever really harnessed and put to practical use, is its probable successful operation in interplanetary space. Rockets, it is argued, can navigate in a vacuum

(Continued on page 73)

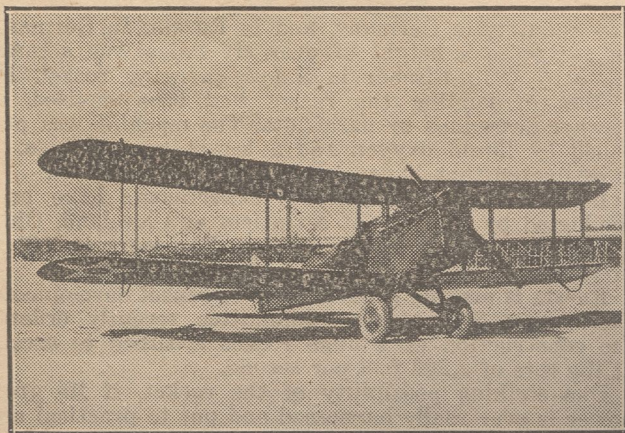
Snapshots of the War



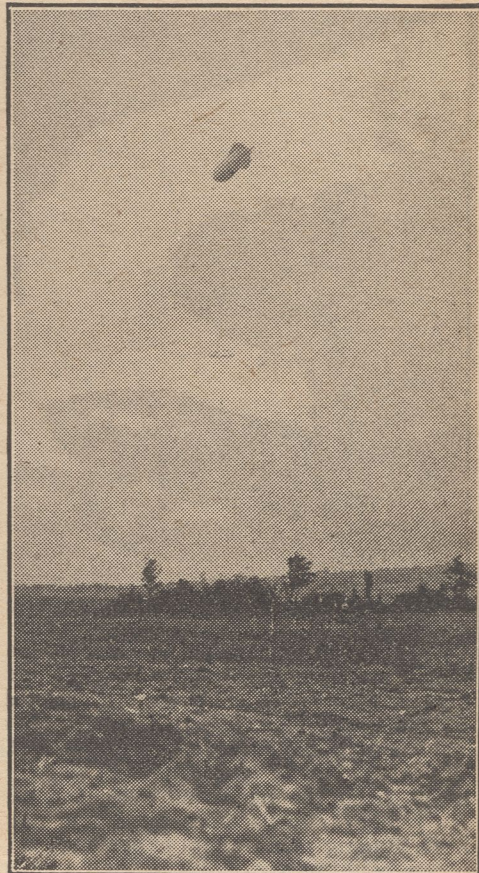
And still they come, the queer ships of the war! This is the German Ago C-1 biplane which was hurled into the fray in 1915. The remarkable thing about this machine is the fact that it carried two large tail booms and only one motor. At first, one gets the impression that it is a two-engined tractor, but actually it only had one 150 h.p. Benz. All that plane just to carry two men.



We have been informed that this was one of the last pictures ever taken of the great Baron von Richthofen. At any rate, he is shown sitting in his noted red triplane, preparing to take off, while his brother Lothar slaps him on the back with a cheery good-bye. This view of the triplane shows the position of the guns as well as any we have ever seen.

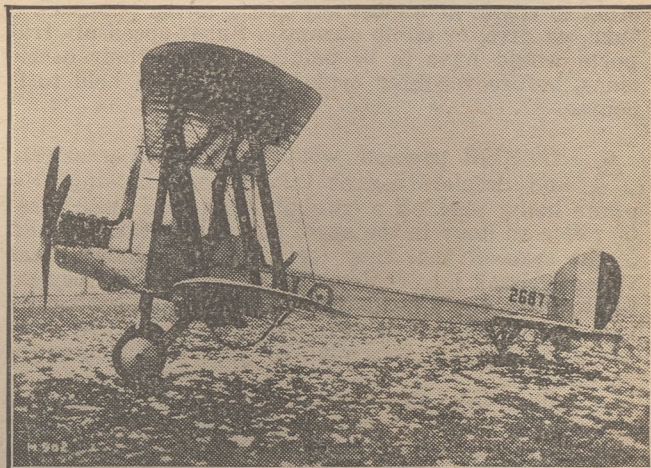


Who said America made no war planes? Here's a DeHavilland 4 manufactured in this country by the Boeing Company. It has the old Liberty engine and carries the late 1918 U. S. Air Service co-cards. And it was not such a bad old bus, at that.



Signal Corps, U. S. A.

Here's an action picture! That flutter you see half way between the balloon and the ground is an observer of the Sixth American Balloon Company on his way down via parachute just after Hans Heinrich, a German flyer, attacked him and made him jump. A few minutes later, American planes hopped on Herr Heinrich and drove him into anti-aircraft fire, whereupon he was brought down. The incident occurred on Oct. 3, 1918, over the road between Cuisy and Montfaucon.



Canadian Official War Photo.

The British B. E. 2c, Britain's answer to the Germans in 1914. It had an 80 h.p. Renault motor, a lot of wings and wire, but no guns. The pilot used an automatic pistol, and the observer was armed with a shot-gun using shells loaded with heavy slugs designed for cutting flying wires and control cables.

"He don't look so good," Phineas said when he peered at von Bountz.



Illustrated by the Author

One Hun, One Hit, Three Errors

PHINEAS SCORES WITH BOUNDERS AND GROUNDERS

By Joe Archibald

Author of "Pfalz Teeth," "Dog Flight," etc.

"**M**IT FIRE," Herr Hauptmann von Bountz orated to his Albatross pilots in the Jerry banquet hall. "You must fight fire mit, ja. Tomorrow I bedt you mein life I gedit das Leutnant Pingham. Der tricks he vill haff, hein? Vell, I giff to him vun alzo, ho ho! I fly mit Staffel Zieben und not mit you, chentlemen. Der Yangkee Bursuit Sqvadron Nine ve meet maybe und vhen das Pingham—nein?" "Ach, you iss smardt, Herr Hauptmann," a Junker pilot complimented him. "If you shoodt idt down das Pingham, you vill be greater as Richthofen." He lifted a

The English team finds the diamond rather wet, and Phineas sacrifices to France the first time at bat. But hang around, fans, the game isn't over yet! Von Bountz is the next one to fly over the plate—and he gets hammered into left field.

glass of schnapps. "Hoch!"

And so Phineas Pinkham was toasted by the Jerry pilots that night—and very nearly roasted the next day.

Dawn patrol. Roosters were just beginning to crow as Captain Howell led his famous flight up into the scraposphere. On a high sky shelf above St.

Mihiel, a half dozen Boche Fokkers teetered. They dropped down, when Garrity's goslings thrust their beaks out through a hole in the clouds, and warmed up their Spandaus on the Spads. Howell hauled his flight to more altitude.

Ordinarily, the black and white Fokkers of *Staffel 7* were a setup for "A" Flight, and even Lieutenant Phineas "Carbuncle" Pinkham could fly rings around their leader without bothering to dig down into his bag of tricks. Much to Captain Howell's surprise, however, one of the Fokkers swooped down, scattered three Spads like a hawk scatters chickens in a barnyard, and then jumped on a fourth in which sat the aforementioned Phineas Pinkham, late of Boonetown, Iowa.

"Somethin's wrong," the flyer moaned as the first Boche burst scraped the Spad's shortribs. "They never had a bum who could fly like that before. If they did, he has got a rotten publicity agent!" Phineas tried every method known to sky pilots for working his way off the sky ropes, but the Fokker pilot wanted nothing less than a kayo. Spandau jabs had both Spad and pilot dizzy. Luckily, help arrived in the shape of five Frog Nieuports.

"*Donnervetter!*" Hauptmann von Bountz yowled and flew to a neutral strata. "Vunce more mit der Spandaus und I would be der hero of *Unter den Lindens*. Ach!"

When Phineas got out of his Spad back on the drome, he still needed smelling salts.

"I get it now," he yipped after he managed to gulp his heart back into place. "Wise guy, huh? That was von Bountz! He ain't foolin' me no more. Gittin' tricky, huh? Well, it is just up my alley. I'll git that big beer mug. You wait!"

"It would've worked if the Frogs hadn't come in," Bump Gillis coughed up. "I never did like them snail eaters. I knew it was the Dutchman the minute he whip-stalled and rolled over on your neck. Nobody else does it as good. Did I laugh?"

"Bump," Phineas snorted, "I will show you somethin' awful comical if you've got time this P. M. It is a open grave which a little lamb fell into and broke four of its legs."

"Compared to that Heinie," Howell said, "those other vons you have knocked down, Carbuncle, were sissies. I would hate to see even you alone in the sky with him. And you're slippin' anyway, ha ha! When I think how the Limies got you with that marmalade last night. Oranges cut up with glue! Ha ha! You had lockjaw for five hours."

"That's somethin' else," Phineas growled.

"I'll fix their wagons, too, the fatheaded cheerio bums! When you push a Pinkham just so far, he makes a lion with the gout look as sunny as a rabbit in love. I am warnin' everybody in the gare!"

"I am sleepin' in the open tonight and maybe for the rest of the week," Bump Gillis announced. "And the mess sarge is goin' to have to taste every bit of grub before I eat it. I wish I'd kept my mug shut," he groaned.

Now, even as Phineas Pinkham walked to his hut, he was turning a pretty piece of skullduggery over in his mind. He was thinking of a Frog road that snaked along the Sur Marne not far from Vaubecourt. It was over this road that the Limeys must travel to get back to their drome when they went to Bar-Le-Duc.

"There's no moon tonight," Phineas mumbled to himself. "That road'll be dark an'—well—huh, I'll try it! It'll be like what happened to me today. They'll think it is somethin' and it won't be. Ta-tat-de-de-dum!"

As a rule a piece of rolling stock should never be taken off an Allied airdrome without consultation with the equipment officer. But Phineas knew that if he ever "consulted," he'd run into difficulties and might not get what he went after. So that night he commandeered a motorcycle and went to Bar-Le-Duc. After a hurried call on Babette, he went the rounds of the *estaminets*

and finally located a trio of Limey pilots whom he knew only too well. There was still a taste of very poor grade glue in the Pinkham oral cavity.

"Well, if it ain't Lieutenant Pinkham," a Camel pusher thrust out. "Jolly time we gyve yer lawst evenin', what ol' pip-pip?"

"Nuts!" responded Phineas and grinned. "Haw-w-w! That was a horse on me. I ain't the guy to git sore. It was a swell trick. Haw-w-w-w! Well—I can't stay long. Cherrio an' a pip-pip! Over the jolly river an' all that sort of thing, haw-w-w-w-w!"

AN hour later the errant pilot skulked in the shrubbery along the road between Bar-Le-Duc and Vaubecourt. His hands had become calloused by twenty minutes of hard labor. He had piled stones in the road and had cut down small trees and placed them where they would do the Limeys the least good. Rusty barbed-wire had been stretched across the road and fastened to two opposite trees.

"Boys, it's a great night," he grinned as he waited. "I could cut slices of mist if I had a knife, haw-w-w-w! They'll have to swing out into this old side road, an' it leads right to a big shell hole. The Limeys don't know it's filled with water like I do. Boys, I hope they can swim, haw-w-w-w-w!" Phineas' guffaw choked off. Two sickly beams of light appeared a half mile down the road. He could hear Limey voices blending in an apology for festive song.

"I'll never stand it," the plotter chuckled. "It'll kill me! Haw-w-w-w-w!"

The lights came closer. The song broke off and a voice called out.

"Sarge, you're jolly well off the road. Swing the wheel, cawn't you?"

"Gor blimie," answered a cockney voice, "strike me bloomin' pink! I ayn't been drinkin' none an' I ayn't off the bloom'n' road. Yuss—blarst it I am—"

"Boy!" Phineas laughed, doubling up.

The Limey car swung into the side road. It had a down-grade and the road-bed was nothing more than soupy clay. Brakes squealed, and Phineas jumped out of his hiding place to see the Limey car slide down into the shell hole.

Splash!

"Haw-w-w-w-w-w!" he guffawed. "Haw-w-w-w-w!"

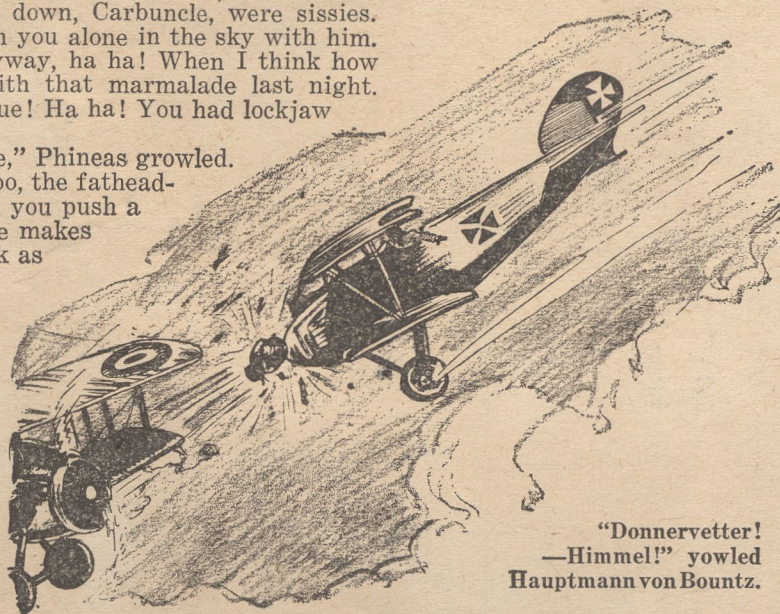
A lot of gurgling sound and noises like big fish flopping around in a shallow pool came to his alert ears. "I'll just go an'

look in on 'em," the Yank trickster decided. "I'll say I was just passin' by—"

Two British officers were crawling out of the shell hole when the hero from Boonetown reached the edge. He placed his motorcycle so that the headlamp would illuminate the fruits of his scheme.

"Why, it's you!" Phineas exclaimed, lending a hand. "And it ain't Saturday night, neither. You Limeys pick the damndest places to go in swimmin'. Is everybody saved? Haw-w-w-w!"

It proved quite a task to get the four Britishers out of the hole. And then, for the second time that day, Lieutenant Phineas Pinkham met someone else who was not whom he had seemed. He had wondered when the third man was pulled into the clear why the other two rushed to his side and showered him with attentions such as would flatter a general.



"Donnervetter!
—Himmel!" yowled
Hauptmann von Bountz.

"You seem to like him," Phineas observed. "How much did he borrow from you? Huh, I better help this other guy out or he'll jolly well drown, pip-pip if he won't! Haw, I never laughed—"

"No end sorry, old chap," an officer was saying to the favored one. "Cawn't understand it. Road wasn't blocked this awfternoon. Your Highness—"

"H-Huh?" gulped Phineas. "A King? How in hell—?"

"You're talkin' to the heir to the British throne, Pinkham," the Limey officer yelled. "Keep a civil tongue in your—"

"B-but," stammered Phineas, "he wasn't with you when I left you. There was only—"

"I've met you before," a voice addressed the culprit. "Lieutenant Pinkham, eh what? Fancy you being here right at this time." The man laughed and got to his feet. "Mustache fooled you, Pinkham. Wear it so I'll not be recognized. Incognito, and all that. Heard about the marmalade, old chap. Liked to have been there. It must have been no end comical."

"Uh—huh—" Phineas stuttered. "Why—er—huh—well—"

The worst was yet to come. An officer slipped away and took a look at the barricade Phineas had built. He came back and complimented him for his ingenuity. Immediately afterward he assured Phineas that he would get a hearing at Chaumont as soon as he could arrange it. It was at that moment that the young gentleman with the mustache discovered that he had lost something. It was an heirloom that surely could not be allowed to remain at the bottom of the shell hole. But there were ten feet of water in the hole and it was very dark water.

"You get your clothes off, Pinkham," one of the British officers cracked. "You're goin' to jolly well dive until you—"

"I ain't no electric eel," Phineas objected. "And anyways I have got a touch of lumbago. If it's a crown with jewels in there, it can stay. Huh, I am sorry, Your—er—"

"Quite all right, old chap," the amazingly friendly royal gentleman put in. "Must get it somehow, though. Can't just go and leave it there."

The Limey officers, drenched to the skin and plastered with mud, got into a huddle. One suddenly remembered that he had seen a Frog diver at work over in a canal near Nancy. He would have to be brought here as quickly as possible. Phineas transported a Limey to the nearest infantry unit phone. Two hours later an official U. S. boiler was toting a befuddled diver to the scene of the Pinkham baptismal font. A colonel came with him. Phineas felt a trifle scared while he watched the diver recover the royal trinket. It had caused the A.E.F. brass hats considerable time and trouble. As to what would happen in Limey circles, he dared not venture a guess.

"**W**ELL, which way is it to Blois?" inquired Phineas when the Yankee brass hat finally walked over to him. "It'll save time and expense if you'll just let me ride over on the motor bike. Yes, I know. I will git arrested when I git to the drome. It'll be a court martial. So save the wear and tear on your tonsils—"

"By gad, this is the worst outrage I ever saw perpetrated," the Colonel blurted out. "Dammit, it'll go as far as a firing squad if I have got the influence at Chaumont I think I have. By—"

As the brass hat spoke Phineas Pinkham did a strange thing. Under the circumstances it would appear that he had already done twice too much. The diver had left his helmet on the lip of the shell hole. Somehow the



Phineas jumped out of his hiding place to see the Limey car slide down into the shell hole.

Pinkham boot nudged it into the water and somehow two tubes that had been attached to it had been cut.

"*Sacre bleu!*" shrieked the Frog diver. "*Nom du chien.* She stay there. All ze way I come *ici* an' dive in ze shell hole. Bah! Somewan he cut ze lines. Eet ees too much. Get me to Nancy, *vite!* I am no longair ze diver. I go back to ze stuffeeng bird an' ze—bah!"

The brass hats were not overly concerned about the helmet. They apologized for ten minutes to the smiling gentleman who stood watching Phineas Pinkham. There was a grin on the chap's face. He did not seem to be listening to the apologies. Suddenly he held out his hand.

"Amazing chap, Lieutenant. Never forget meeting you. Had something to do with the marmalade, eh, Lieutenant?"

Phineas grinned broadly. "Yeah, I warned everybody. When a Pinkham—"

The Colonel escorted Phineas to the Ninth Pursuit Squadron. He shoved the culprit into Major Garrity's sanctum and slammed the door.

"That moron of yours," he bawled, "has done it now! Almost drowned the heir to the British throne! Blocked up a road and wrecked a British car. Well, Garrity, say something!"

The Old Man couldn't.

"Oh, I confess," Phineas lashed out glibly. "He was disguised. How would I know he was with the Limey pilots? First it's von Bountz in another ship in the wrong *staffel*. Now it's a royal heir with a mustache he shouldn't have. Huh, Major, you are not Jesse Willard melted down, by any chance?"

Garrity found his voice then. He bellowed at Phineas for ten minutes without a pause to freshen up his bellows. Then he turned to the Colonel.

"Do me a favor," he said. "Leave this ape on this drome. Don't take him to no klink. When you get the guns loaded and find a nice stone wall, he'll be here waiting but I want to work on him for a couple of days myself."

"He knows he can't take me to jail," Phineas snapped. "The royal heir told me he would get me a lawyer, or somethin' like that. Huh, it's him who was almost drowned and he is kickin' the least. He's got a sense of humor. Haw-w-w-w-w!"

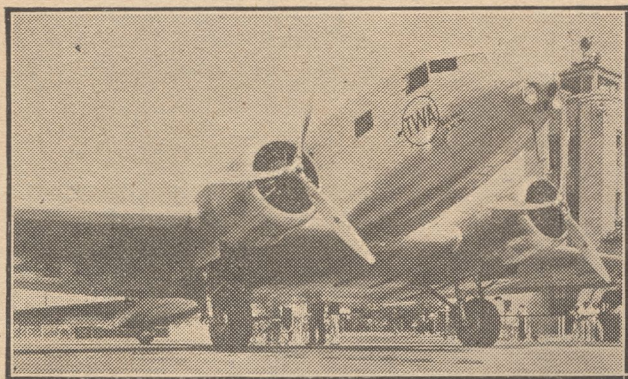
When the Colonel had gone, Major Rufus Garrity went to work on Phineas Pinkham again. He insulted the erring pilot, grounded him, and put him under arrest.

"Is there something you forgot to do to me?" Phineas chirped at last. "I must know now, as—"

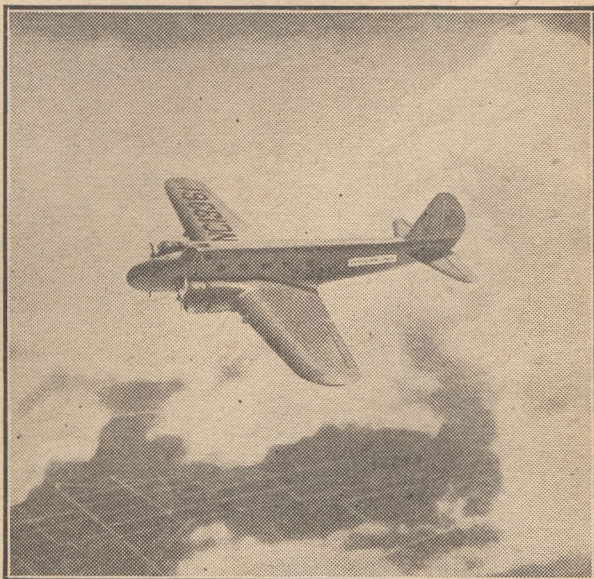
He was about to rudder around and dive for the door, when an idea exploded inside his cranium.

(Continued on page 73)

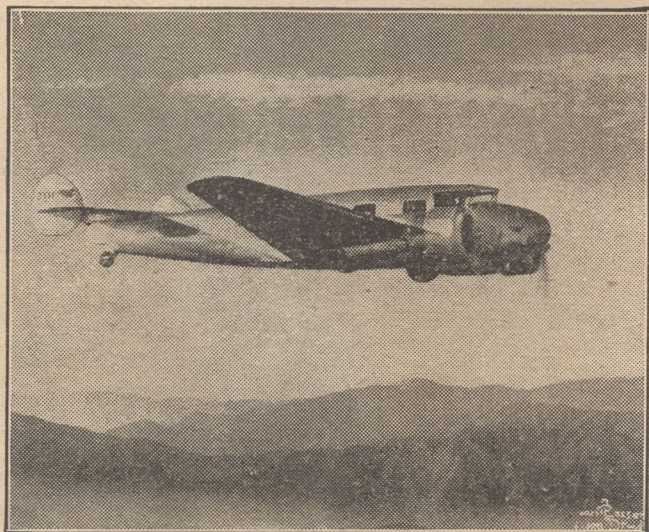
America's Transport Triumphs



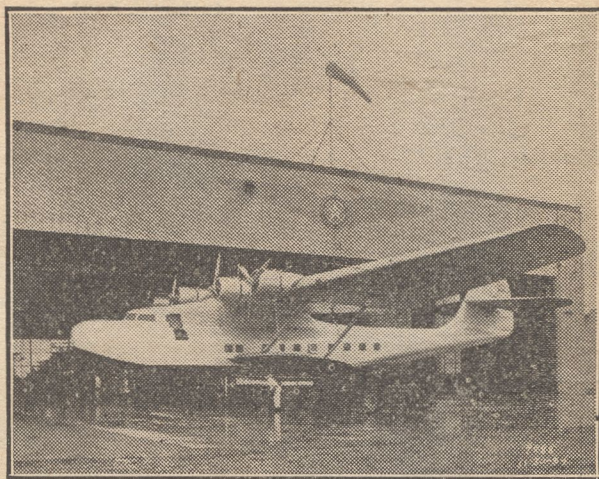
America leads the world in air transport speed and efficiency, and one of the big reasons is the crack Douglas air liner. In this under-ship shot, note the staunch, yet retractible, under-carriage and the streamlined tail wheel.



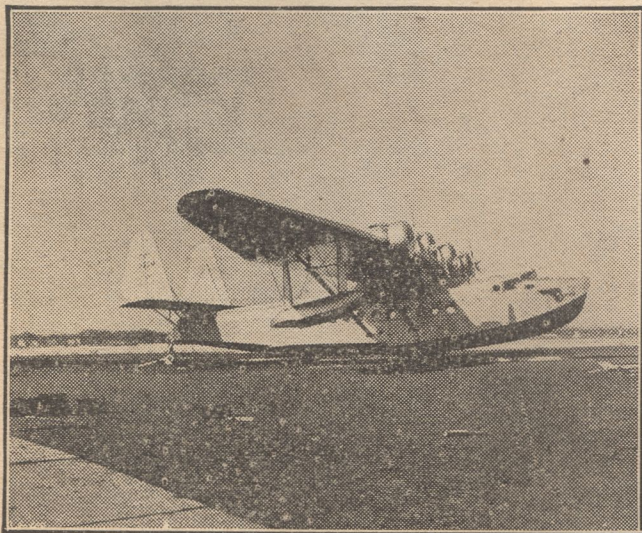
United Air Lines ran up an enviable reputation with the use of the famous Boeing 247-D, a replica of the special job Roscoe Turner used in his great show in the England-to-Australia race. United uses them for passenger, mail, and express work.



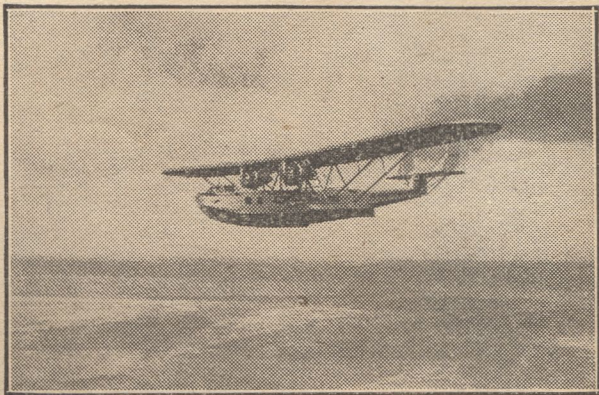
The Lockheed "Electra" high speed monoplane transport developed for special transport work both here and abroad. It is believed that many of these will be used in Australia, as Kingsford-Smith has a warm spot in his heart for the "Electra"—and what Kingsford-Smith says in Australia, is the last word.



The new Martin Clipper, built by Glenn L. Martin in Baltimore for the Pan-American Airways, is so big it has to be drawn out of the hangar sideways on a special wheeled cradle towed by a tractor. It has recently passed its flight tests and astounded the pilots by the remarkable speed in which it lifts itself clear of the water.



At present this is the largest flying boat in the American regular service. It is the Sikorsky S-42, known now as the Brazilian Clipper. It carries 22 passengers at a speed of 138 m.p.h., and the four Hornet motors pack a total of 2,880 h.p. Pan-American uses them on all the present South American routes. It measures 114 ft. from wing-tip to wing-tip.



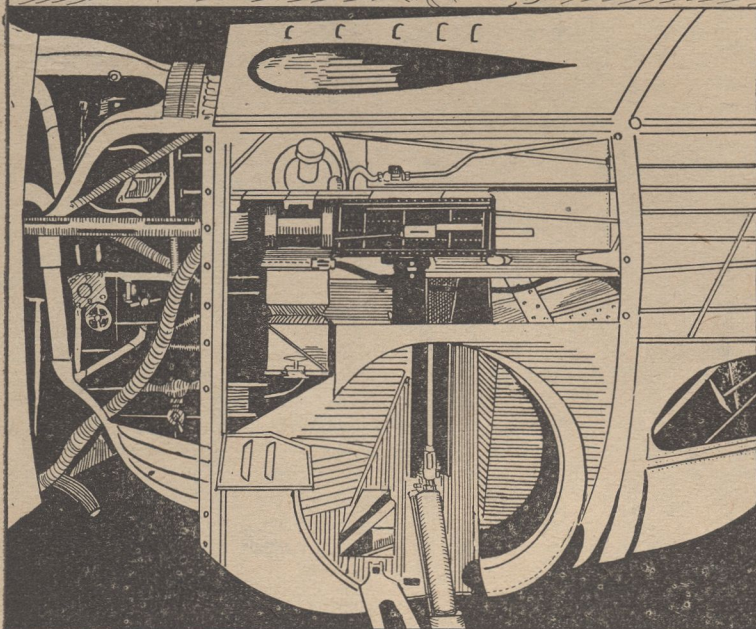
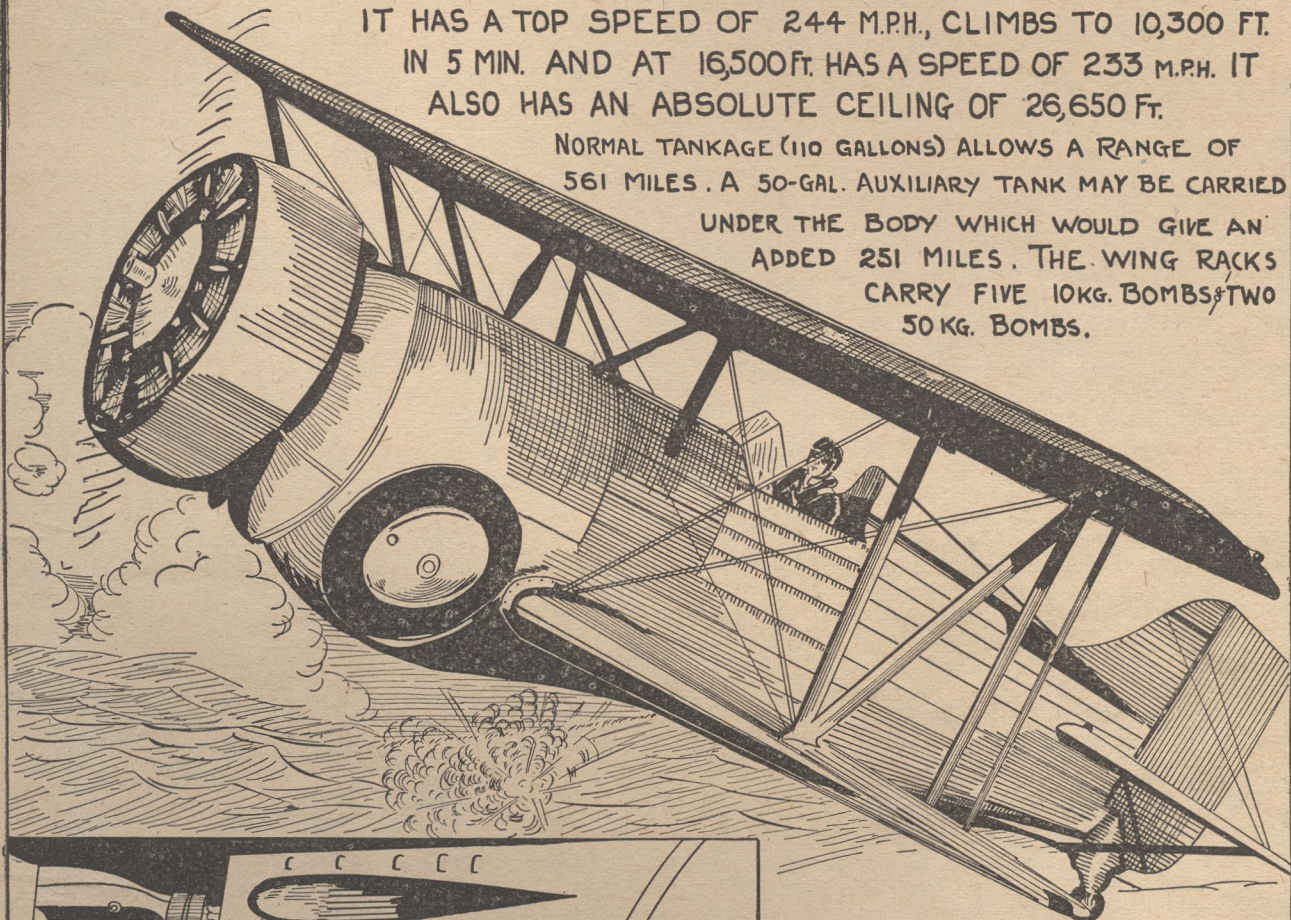
Another interesting flying boat of the Pan-American Airways is this 22-passenger Commodore, a transport version of the long range flying boats made by the same company for the U. S. Navy. Several are still in use on the shorter hops of the Caribbean service. It was with ships of this type that Pan-American first made its great name in the tropics.

ANOTHER FROM THE HAWK'S NEST

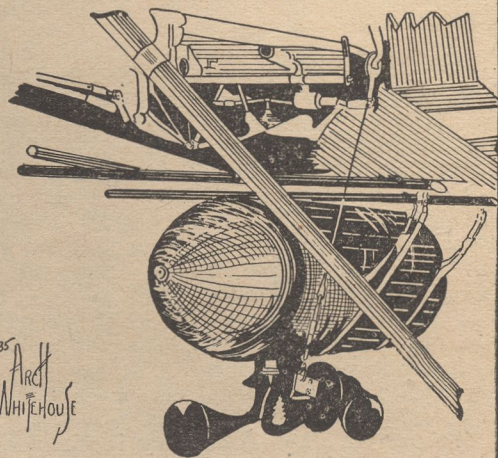
THE NEW CURTISS HAWK TYPE III FIGHTER

THIS SHIP IS DESIGNED FOR HIGH ALTITUDE FIGHTING. IT HAS A TOP SPEED OF 244 M.P.H., CLIMBS TO 10,300 FT. IN 5 MIN. AND AT 16,500 FT. HAS A SPEED OF 233 M.P.H. IT ALSO HAS AN ABSOLUTE CEILING OF 26,650 FT.

NORMAL TANKAGE (110 GALLONS) ALLOWS A RANGE OF 561 MILES. A 50-GAL. AUXILIARY TANK MAY BE CARRIED UNDER THE BODY WHICH WOULD GIVE AN ADDED 251 MILES. THE WING RACKS CARRY FIVE 10KG. BOMBS & TWO 50 KG. BOMBS.



THIS SHOWS THE GENERAL ARRANGEMENT OF THE MACHINE GUN, TANKS, AMMO BOXES AND THE WHEEL WELL ON THE PORT SIDE.



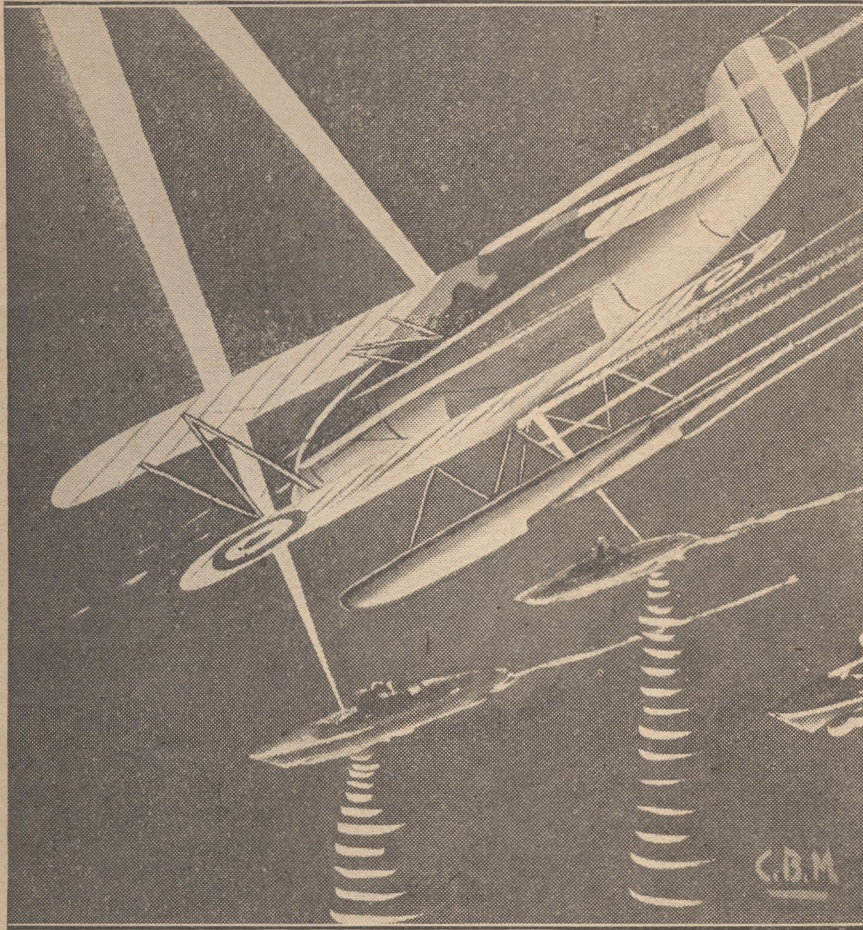
35
Arch
Whitehouse

THE CENTER BOMB RACK ALSO HAS FITTINGS FOR A SMOKE-SCREEN TANK CAPABLE OF DISCHARGING A 4,500-FOOT SCREEN SUITABLE FOR NAVAL AIR TACTICS.

STARTLING "KERRY KEEN" NOVELETTE

By Arch Whitehouse

Author of "Hawks of Hate," "The Griffon's Gamble," etc.



Cudmore tried to get at the "Santiago," but under a smothering blanket of fire from above, his TG-2 burst into flames and drove full tilt toward the dark waters. The black ship curled away with a roar.

him downward. The grim gun covered him menacingly. He nodded and set the TG-2 into an easy spiral. Then he leaned back, snapped a radio panel switch, and raised a hand-mike.

"Calling WPFS— Calling WPFS—" he chanted into the mike.

He listened for an answer. In ten seconds it came, for he knew WPFS was standing by for such a call.

"Jannings calling—Jannings calling," he explained in a crisp voice. "Near point Judith. Am being attacked by a black biplane. Am being ordered down."

"What's the matter?" came the answer. "Can't you get away?"

"No guns—no fixed gun on this craft. Movable Brownings in front and rear pits, but am carrying no gunners. He's firing at me—across my nose. Can't . . . can't get away?"

"You've got to get away," came back the voice from WPFS. "It's all set for tomorrow. I'll blow on you, if you don't."

With a gasp, Jannings slipped the mike back in its prongs, as the black demon relentlessly drove him to the earth. He sobbed, stared at it helplessly.

Half way down, he tried to get away, but the black biplane was on him like a scourge. Flame spat from the rotator gun in the trough and his outside wing-tip vibrated madly under the torrent of lead. Down—down they drove him with the vengeance of a hooded falcon.

The area below was peaceful. There was enough light

In a Connecticut field, its prop still turning, lay a gleaming Navy TG-2—with only a grotesque corpse at its controls. And hardly had grim Death struck, when it struck again! But now the swath of that ghastly scythe descended toward the proud aircraft carriers of the U.S. Fleet—and but for a scarlet tipped brush—

to select a landing field amid the easy rolls of a clipped hay field. Jannings put her down, let her idle and sat waiting. The black biplane eased in behind him and ran up under its own inertia. The front section of the cockpit cowl slid back, and a man in a steel-gray flying kit stepped out and walked toward him with a black gun in his hand. He wore no helmet, but the upper portion of his face was shielded with a close-fitting scarlet mask.

"The Griffon!" gasped Jannings. He hurriedly reached down for his automatic—and the shot which he fired echoed above the rumble of the two idling motors. The man in the mask hurtled forward, but he was too late. Jannings lay back in his cockpit with the top of his head blown off.

HALF an hour later at a small airport outside Portland, two men sat at a small table. Behind them gleamed the panel of a small but highly efficient radio. The smaller man

was talking into a telephone with short, crisp words. "Yes—Lieutenant Allbright aboard the *U.S.S. Rangely*. Yes, they have a ship-to-shore hook-up for telephone. Fine."

The small man, dressed in neat worsted, glanced knowingly at the man opposite. The latter was a stoop-shouldered giant with hands as large as hams. He had a cold, deep-lined face that was unusually mobile in expression. The eyes were small and seemed to flash greenish fire.

"Allbright will *have* to do it," he said to the smaller man gruffly. "What the hell happened to Jannings—after all that trouble?"

"I'm beginning to have my suspicions, Warner," replied the man with the phone. "Hello! . . . Hello! . . . The *Rangely*? Let me speak to Lieutenant Allbright, please. Yes, Lieutenant Allbright."

The short man turned back to Warner. "He can do it, if he's careful. We've *got* to do it now. Those Navy yaps will talk unless we finish the job and they get their dough."

"You're right, Schloss," growled Warner, starting to pace the floor. "Make it plain that our plan must go through, Jannings or no Jannings."

"Hello! Hello! Allbright? . . . That you, Allbright? . . . This is Professor Schloss," he winked at Warner. "Yes, Professor Schloss. I called to let you know that your brother Jan . . . you know Jan . . . well, he

(Continued on page 56)

Bugaboos of the Birdmen

By Kenneth Brown Collings

Author of "A Sea Hawk's View of the War Games," "Raid of the Unseen," etc.

With Illustrations by Joe Archibald

"DON'T be such an idiot," chided the fledgling aviator. "Take the third light off a match? Certainly I'll take the third light. I'm not superstitious. Here, gimme!"

He took a few drags of the cigarette, then tossed it aside and climbed into his plane. Nothing went wrong until he landed ten minutes later.

The wheels touched the ground in what looked like a perfect landing, the plane rolled a few feet—and mired to the hubs in a concealed soft spot in the field. The propeller snapped off short as the plane stood on its nose. For an instant it poised vertically; then settled over on its back with a sighing "scrunch." An expensive "scrunch"—three or four hundred dollars worth!

According to the superstitious old timers on the field, he had it coming to him. For his action infringed the flying clause of an old familiar bugbear. The third light on a match, airmen hold, does not invite death or major disaster. But it brings minor curses—delays, troubles, and breakage.

In the early days, flying was a hazardous business. Sudden death lurked under your wingtip. Luck—good and bad—seemed to be the only reason why some aviators survived, while others, reputedly more skillful—died.

Many pilots subscribe to this luck theory. Flying superstitions are numerous. Some of them are as new as the science of flight, while others, such as the third light, are merely modifications of age-old beliefs.

Let me make one thing clear: I take little stock in these superstitions myself. I merely find the ridiculous things some aviators do to propitiate the gods of luck, remarkably fascinating.

Take the matter of a black cat crossing your path. At a Virginia flying field, just after the war, the boys had a mascot, a midnight hued tom cat. During the day time, Tommy—like most of his kind—was an inveterate sleeper. The only thing which could be relied on to rouse him from his slumbers was the cough and rumble of a revving airplane engine.

At the first roar, Tom was wide awake. And as the noise of the warming motor grew louder, Tom dodged this way and that, seeking an escape from the racket.

The pilot gunning his motor for the take-off was the last straw to black Tommy's nerves. He fled, more often than not, across the field for shelter beneath the underbrush at the far side. The fact that this course took him squarely across the path of the onrushing airplane, meant nothing to Tom. He probably didn't know he was bad luck.

But it meant plenty to some of the pilots. A death

and a couple of crack-ups were blamed on that cat. Some of the boys were in favor of ending his career in the cold waters of the Potomac River.

"Not a chance," said Pep Graham. "I like old Tom. Besides, I've got an idea. The way I dope it, a black cat can't give another black cat any bad luck. So I'm going to paint a black cat on the side of my plane."

He did just that. Furthermore, he used a large figure 13 as a background for his life-like portrait of Tom. Pep's reason for this was complicated.

"Suppose," he said, "that after my painting that black cat on the fuselage of my plane, Tommy *doesn't* run across my path on the take-off. That would leave me holding the bag. I'd be riding with a bad luck design on my ship and nothing to take the jinx away. The way I figure it is this: bad luck added to more bad luck equals good luck. So I added the figure 13."

Does all that make sense? I don't think so personally, but I'll tell you the history of that airplane. Other planes had troubles aplenty in those early days of poor fields and questionable motors, but "Black 13," as this ship was rechristened, led a charmed life for many months. Then came the climax.

Early in 1920, Pep Graham took "Black 13" and hopped off from Virginia for Atlantic City. Pep was a delegate to an aerial congress there.

That was quite a long hop for that old plane. Pep couldn't make it in one jump—couldn't carry enough gas. He would have to head north to Aberdeen and refuel, then fly almost due east across the Chesapeake and Delaware Bays—all this in a land plane, and with a motor that had seen its best days. He would be almost out of gas *again* before he reached Atlantic City.

A lot of other pilots advised Pep to take some other plane. Most of them were suspicious of that black cat-thirteen combination. They begged Graham not to jinx himself on those long over-water jumps. They urged him to take a different ship.

Pep only grinned. He took off and reached Aberdeen without any trouble. Here he regassed "Black 13." There were

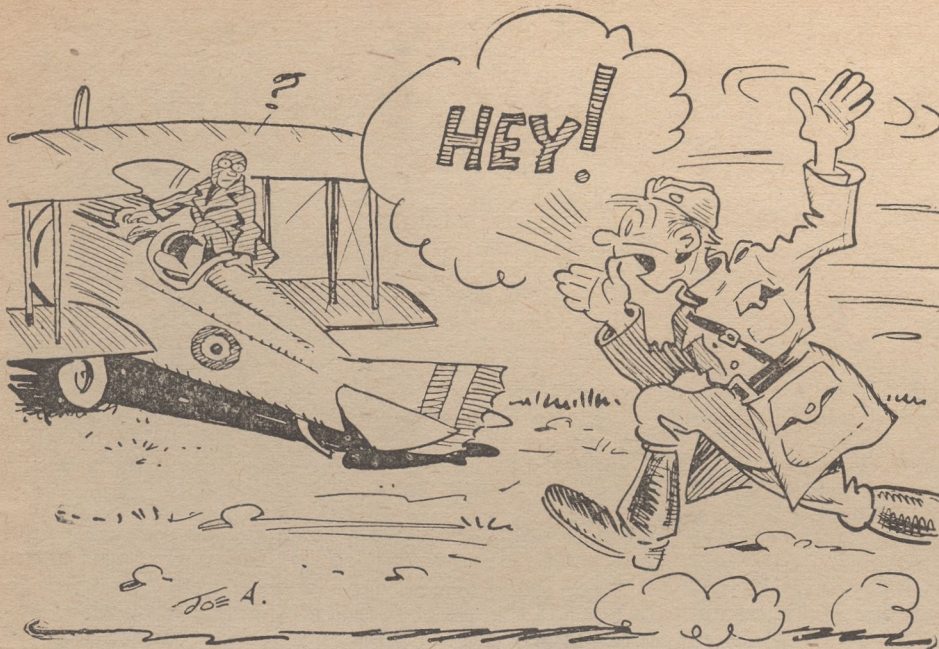
no weather report services in those days. No one at Aberdeen knew that there was a heavy coastal fog hanging over Atlantic City, that it was as thick as pea soup with no visibility whatsoever. How could they know *that* when the sun was shining brightly at Aberdeen.

Pep hopped off. He had enough gas for two hours, and it was about an hour and forty minutes to his destination. He was flying at about three thousand feet.

He crossed the two stretches of open water without any trouble. The ocean loomed up far ahead—blue and clear as crystal. But what was that streak of milky,



"Fire!"



"Don't climb in the right side of an airplane!"

fluffy white curtained all along the edge of the water?

PEP came nearer. The white line took on a silvery hue. Then he knew what it was. It was the sun shining on the top of a strip of fog. The murky haze didn't reach more than a few miles inland, but that was too much. It completely covered the city and the landing field. Inland from its edge was mostly boggy ground. Pep couldn't make out a suitable landing field.

He didn't have enough gas left to look very far; he must do something quickly. He spiraled lower to find out if by any chance there was any space between the lower edge of the fog and the ground—maybe he could just sneak under.

Sneak under? That was a laugh. The fog was below the building tops! The gold dome of the boardwalk hotel suddenly poked through the top of the soup. For a second it glimmered in the sun, then disappeared. Graham was caught—caught cold.

He gave up the attempt to find the airport. That was impossible. But he had to find some clear spot before his gas gave out. Even though it was not a good landing place, if he could see, he could probably get down alive. Where he was, he would kiss the side of a building, sure. Would certainly kill himself—and probably people in the streets besides.

Pep turned the nose of the plane inland. With a cough and a wheeze, the engine sputtered and died. He was out of gas, perhaps a hundred feet off the top of the fog—and barely four hundred feet off the ground. He pushed his nose over to maintain flying speed. He had to, but it looked like the blow-off to Pep.

In the ghastly few seconds before he plunged into the billowing mists, he muttered, "Well, 'Black Thirteen,' it looks like your jinx has caught up with me at last."

He had hardly finished the thought when below him the maze of fog swirled aside—and for a second, Pep glimpsed the ground. Even that wouldn't have saved him had he been over city streets. He wasn't. Squarely below stood a line of parked airplanes—he was over the airport!

Pep cocked up his wings and dropped through the hole like a plummet. Ten seconds later he glided to a dead stick landing. The fog was again so thick that the mechanics who ran out to help had to be guided by the sound of Graham's voice. They couldn't see him.

How about it, reader?

Would you climb into a plane on the right side?

Would you fly without your first solo helmet?

Would you let a cigarette stub burn on, say, a 42nd street sidewalk?

—Well, before you do, read what Mr. Collings has to say about it—and maybe you won't.

You say the black cat and the thirteen didn't have anything to do with the lucky landing? I'm inclined to agree with you, but Pep said they didn't hurt any, either. And that wasn't the end. It was several more years before old Black 13, still unscratched by any accident, was honorably retired from service as obsolete.

Many early flyers were ex-cavalrymen who were trained to mount a horse from the left, and that may account for the superstition that you must always climb into an airplane from the left side.

Early model airplanes were built that way, with steps and doors on the left. More recently, practical and unimaginative designers, caring little for the superstitions of pilots, have turned out most planes with doors on the right. The pilots must, perforce, either fly them or lose their jobs.

Most of the new school of pilots don't seem to mind much, but the old timers have evolved various ways of beating the right-side-door jinx. In open cockpit planes, I have often watched them scramble up over the high cowl on the left and with great difficulty wriggle into their seats from that side rather than use the easy mode of entrance provided on the right.

In closed cabin airplanes that, of course, is impossible. Jinx or no jinx, they must enter from the right. The more superstitious boys have their various ways of neutralizing the bugaboo. Some cross their fingers when entering and some fly with a rabbit's foot in their pockets. I know one pilot who always spits on the tail of such an airplane before entering. This seems to be another example of two "bads" equalling one "good."

Perhaps the pilot has no respect for planes with right hand doors, and he only spits on things for which he has no respect. Or maybe he has no respect for himself



The time-honored black puss jinx

when he spits on things, in which case he would be a jinxed pilot in a jinxed plane.

At any rate, he thinks it works for him. That pilot has been flying safely a long time, but that is undoubtedly coincidence too.

A few years back a new model training plane came on the market. The gas tank, just forward of the cockpit, was so arranged that the pilot's feet on the rudder bar protruded into a very small space between the floor boards and the bottom of this tank. There was so little clearance that the tips of his shoes rubbed against the bottom of the tank. On leaving the factory, the tanks were painted a silvery aluminum. For the first few flights after delivery, the paint rubbed off easily. Thus, the pilot who first tested the ship invariably landed with the tips of his shoes stained a bright silver.

The belief soon sprung up that the destiny of those silver-tipped shoes was linked with the fate of that particular airplane provided the stain wasn't removed from the shoes. If the first flight was perfect in all respects, you couldn't pay the pilot to clean his shoes. But if trouble had developed, he headed for the nearest shoe-shine stand. Otherwise, the shoes would jinx him in every airplane he flew. For several years, old, unshined silver-toed shoes were a familiar sight around many airports.

IN France, during the war, pilots often fashioned skull caps from the tops of their wives' or sweethearts' stockings. These, so they claimed, were a sure-fire protection against German bullets. Other trophies of love, such as handkerchiefs and bits of ribbon, were treasured for their good luck qualities.

One pilot refused to take off until his lost fetish—the white uniform cap of his nurse-sweetheart—was located. He was frantic in his efforts to find it, and was convinced that without it he would be a sure mark for enemy bullets.

The potency of these talismans of the war birds was often the cause of heavy arguments and even fist fights. One thing is certain—their owners believed in them implicitly.

In the belief that they would ward off misfortune, an array of mascots ranging from turtles to lion cubs has been carried aloft. With the more spectacular of these—full-grown leopards and large-size snakes—I suspect their owners had more of an eye to publicity than luck. Others, however, really attached great value to their pets as luck charms.

An American pilot stationed in Haiti, where black magic abounds, had a dog which invariably rode on the floor of his cockpit. In the small space beneath a flyer's legs, completely surrounded by control wires, a dog must lie absolutely motionless. This one always did, for he seemed to realize that the least movement on his part might result in wrecking the plane.

One day the dog's pilot-master discharged his Haitian house boy who broke too many dishes. The ex-servant swore vengeance. A few days later, the dog was taken violently sick and despite frantic efforts died in agony from some obscure Voodoo poison. The pilot was heart-broken.

"There," he commented bitterly, "goes not only a fine dog and a swell pal, but all my luck as well."

That was probably a lot of tommy rot, but the pilot believed it. And although it had been years since he had suffered any accident, immediately after the death of his dog, the pilot's luck changed. In less than one

month, he had two forced landings and one crash from which he narrowly escaped with his life.

Why did the house boy take this method of "getting hunk"? Because the low-class Haitian, believing implicitly in his own Voodoo charms, gives ready credence to the fetishes of others.

The Haitian boy knew that his former master placed great store in the luck-bringing powers of his dog. What could be more natural to such a person than to figure that the surest way to bring disaster to the pilot was to do away with his fetish.

But in the boy's case, you can bet that he consulted a Papaloi—Voodoo priest or conjuror—to get it done. Except under powerful protection, no superstitious Haitian would dare tamper with the magic of another. He would be afraid of incurring bad luck of his own.

Lucky coins, horseshoes, rings and such tokens by the thousands, have been carried in airplanes. Each is supposed by its owner to have merit in bringing about the much-desired "happy landings." One famous pilot refuses to fly any plane with the numeral "9" anywhere in the number. Another, equally well known, dislikes "7."

To carefully preserve the helmet or goggles in which they made their first solo is a common habit with aviators. I have known pilots who lost these articles and have spent time and money all out of proportion to the value of the lost equipment in an effort to regain them. New and more modern articles are available to replace the mislaid gear, but all old timers know the futility of urging a substitute when they hear the familiar reply:

"But I *must* find that helmet! I wore it on my first solo. I'll lose all my luck unless it turns up."

Ridiculous, you say? I'm inclined to agree with you. Certainly, it's far fetched, but the boys believe it, and there it is.

There are flying superstitions which started out as plain common sense and then acquired magic qualities as time passed. A certain military squadron was preparing to attend an air meet where substantial prizes were at stake. For no reason other than to present a distinctive and colorful appearance to attract attention, all the pilots dyed their white silk mufflers a brilliant scarlet.

The entire affair was a great success for the squadron. The long round trip was completed without mishaps of any kind. And the red-muffled pilots won their share of the prizes.

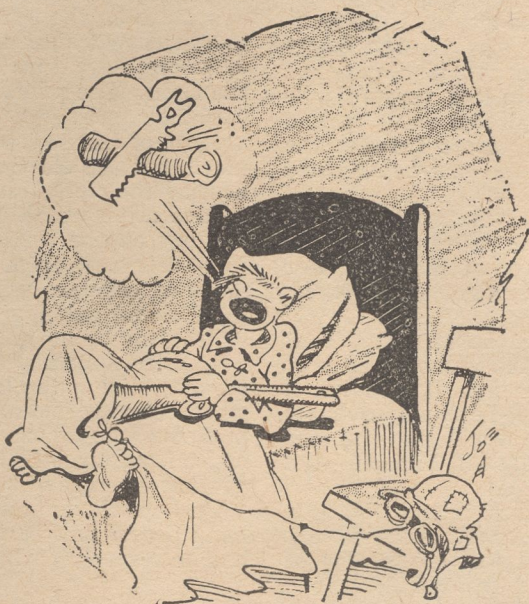
But now the red mufflers took on a new significance. They became luck emblems and as such were highly cherished. The pilots continued to wear them long after their return from the air meet. Many took them

along when they were transferred to other posts. Even now, you will find scarlet mufflers scattered around many airports. But don't try to buy one from its owner. It's not for sale.

Fabric airplanes are highly inflammable. Common caution, therefore, dictates that you should step firmly on a cigarette butt when dropping it around an airport. Crushing stumps under a twisting heel started from necessity, but gradually it has taken on a good luck significance.

Watch some aviator when he is off duty. Watch him as he walks along a paved street where his cigarette couldn't start a fire if it tried. See him throw that cigarette stub several feet to the fore as he walks? Did you notice that his apparently careless toss landed the

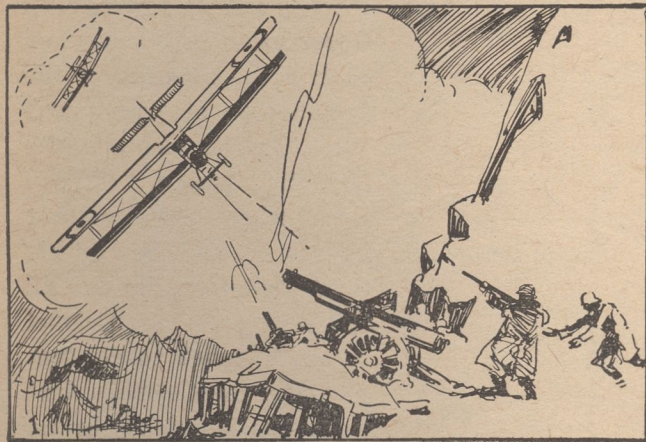
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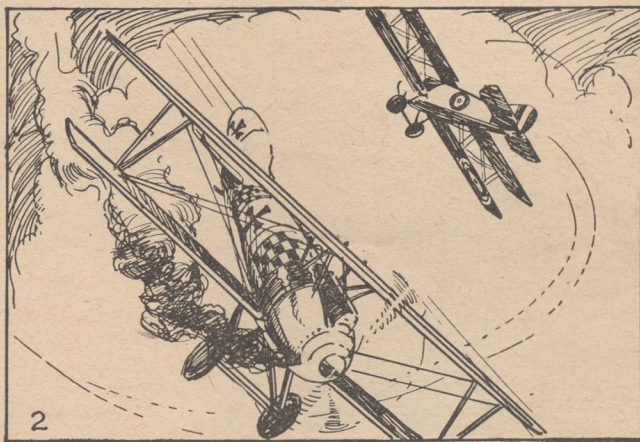
Ingenious anti-rob safety device for protecting one's very valuable first-solo helmet and goggles (designed and recommended by Joe Archibald)

Lives of the Aces in Pictures

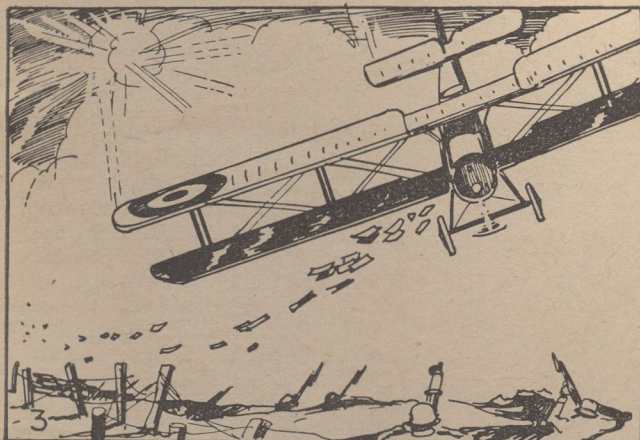
XL—Major Francesco Baracca, Italy's Ace of Aces



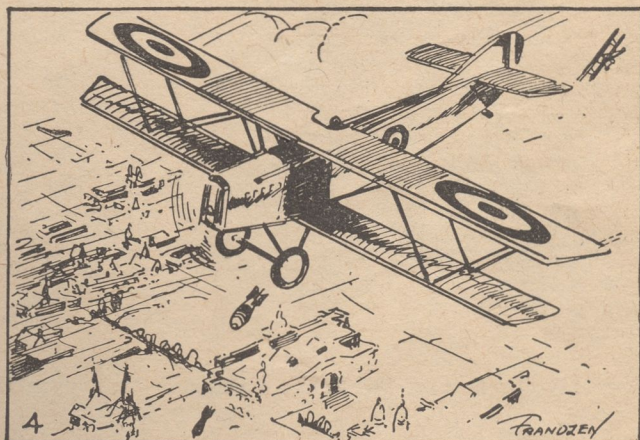
1—Francesco Baracca had already spent years in the Italian cavalry when Italy declared war. Although much older than other pilots of the air service, his training in tactics persuaded the authorities to admit him. While piloting an observation plane, he raided the mountain peak lookouts of the Austrians in the Carnic Alps, causing great havoc.



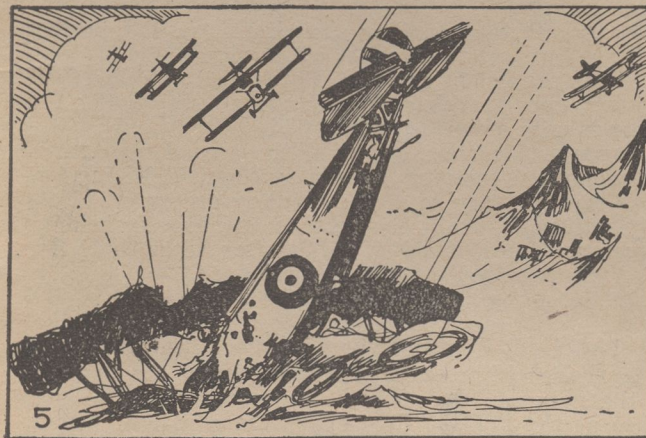
2—Baracca quickly became a menace to the enemy through his accurate knowledge in artillery spotting. While returning from one of his trips, he met several enemy planes. They surrounded the slower observation machine, and Baracca's observer was killed while defending their ship. Baracca, however, swung around and downed one plane. The others withdrew.



3—Though Baracca was a skillful fighting pilot, he felt his talents more effective in combatting a more insidious kind of warfare—Austrian propaganda was being distributed in the Italian army. Baracca retaliated. He bombed the Austrian trenches with pamphlets written to destroy the soldiers' confidence in their commanders.



4—Baracca determined to spread his propaganda to include civilian populations. He flew hundreds of miles into enemy territory to drop leaflets on Vienna and Budapest. In all his thousand flights, none were so dangerous as those long trips into hostile country where he often fought enemy ships, always adding to his line of victories.

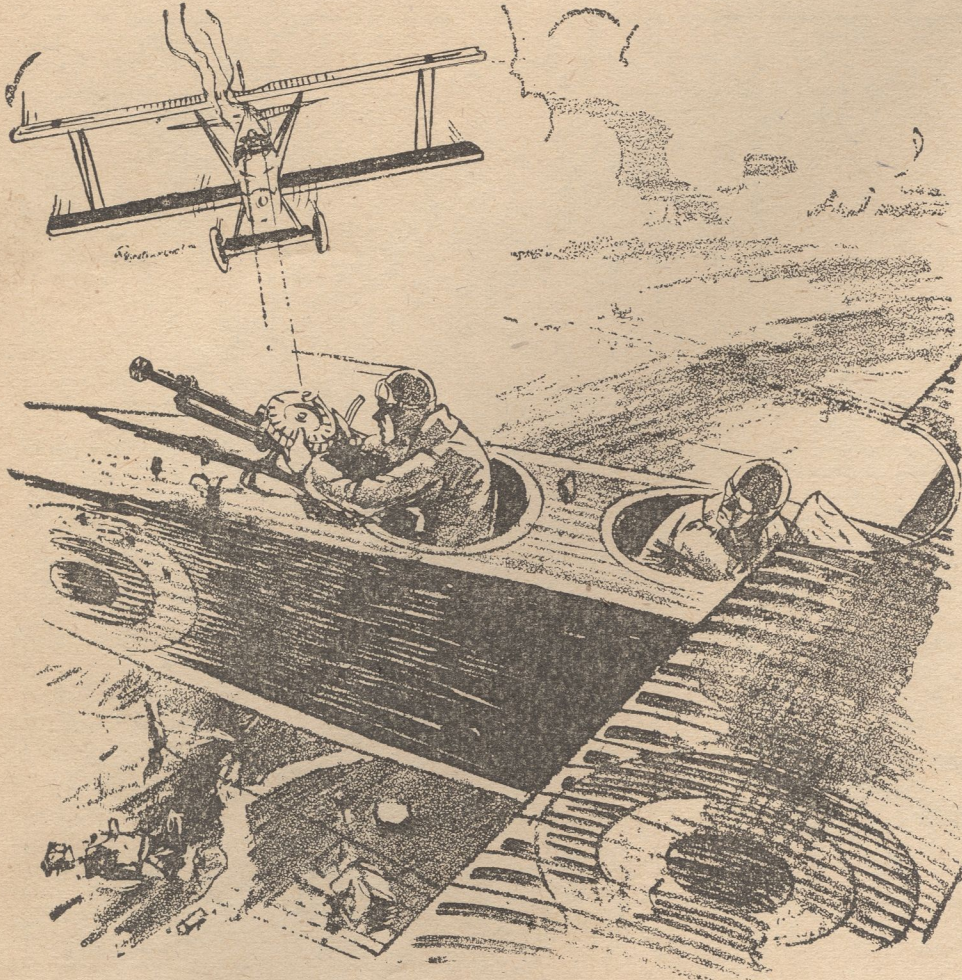


5—Baracca's victories finally totalled 36 enemy craft. Then, on his return from a raid on June 21, 1918, Baracca finally met his death. He was met by overwhelmingly superior forces of enemy ships. He put up a gallant fight, but his plane was set on fire and fell close to the Italian lines.



6—Francesco Baracca was born in 1883. He was a fine looking man of military bearing whose training in war strategy was invaluable in his air career. To the propaganda raids of this daring airman may be credited a large share of the shattered morale which led to the Austrian Empire's downfall.

Salmson Symphony



Suddenly the first of the Fokkers pounded down upon them, boring in a charge of smoking tracers.

CAPTAIN "CHUCK" ROCHE was worried. From the rear pit of his Salmson, he could see the German ammo dump behind Hill 37, FM. For almost a week he had been able to see that ammo dump from the pit of his Salmson, and for almost a week he had been unable to direct the fire of the 14th Artillery to a direct hit. Always it was the same story—it took too many range shots to get location, and the crazy way the 14th plowed things up around the dump was both confusing and bewildering.

And now, still without location, he saw his pilot, Lieutenant "Windy" Hogan, pointing to some objects in the sun. Words were unnecessary. German Fokkers were upon them, diving to drive the Salmson away from the dump, or shoot it down with chattering Spandau fire.

He caught Hogan's attention as he leaned forward to poke him in the back. "Hold tight for a while," he instructed. "We've got to get this dump now! Pop may not be alive if we have to try again." Pop was Major Fielding, C.O. of the 53rd Observation Squadron, now on his death bed with shrapnel in his stomach and pressing on his lung.

Hogan, a grim, game fighter nodded understandingly, as the key under Roche's hand tripped out, dit, dit, da, dit! Hold longitude; latitude 300 feet south.

The Salmson reared up and circled to wait. The five Fokkers continued to bear down upon the observation crate, as Spandaus began their yammering chatter. Hairy lines of tracer smoke passed between the front

It was a sad day for the 53rd Observation Squadron when their C.O.—maestro of the symphonies of war—went West. And it was a bitter hour for Captain "Chuck" Roche when he learned that he was not to follow in his C.O.'s footsteps. For G.H.Q. had sent a certain Colonel James Fenwick to do that job—and the Colonel's first move was to publicly brand "Chuck" a liar and a coward!

★ ★ ★

and rear pit of the Salmson, almost under the very nose of Roche.

Startled for the moment, Chuck swung to the Lewises and levelled them on the nearest Fokker. They blurped under the pressure of his hand, and the Kraut crate hesitated in mid-air as though undecided about what to do. The Lewis pumped lead at the large blur that was a revving prop, and suddenly the prop disappeared. The bottom of the motor housing crashed open as a broken piston tore things apart, and the Fokker nosed quickly down.

At that instant, the top of Hill 37, FM puffed into a

mushroom of flame, smoke, and sand as the shell from the 14th Artillery Base broke. With a muffled curse, Roche dropped his Lewis like a hot match and picked up his wireless key. What the devil was the matter with that 14th, anyway? He had given them orders to change latitude 300 feet, and they had changed it almost three thousand.

At that instant another shell broke. It had perfect latitude, but was twenty feet off longitude.

"What the hell?" exploded Roche. "Have those fools got two guns working? Which one do they think I'm going to wire orders on, anyway?"

Hogan nodded. He had seen the second mushroom. Somebody was certainly crossing up signals. Firing two guns was contrary to all air-artillery orders.

"Somebody's brain has got too much slipstream," Hogan screamed, winging the Salmson so he could line his Vickers on a Fokker to beat it back.

Da, da, dit—da! Repeat shot, he wirelessed.

ANOTHER Fokker swung in upon them, blazing a runner of brown tracer holes across the fuselage of the Salmson. Once more Roche smeared his Lewis brace at the Fokker. Chattering like a pair of defiant monkeys, they pounded and throbbed. The Fokker pulled off, gunned up, and fell upon them from a dive. Blocked by overhead wings, Roche's sight was helpless; the Lewis was useless, idle.

A second later Roche saw Hogan go stiff, straighten, and move convulsively. A shot from that overhead Fok-

A GRIPPING OBSERVATION SQUADRON STORY

By Edwards A. Dorcet

Author of "Ghost Gauntlets," "At Suicide Pass," etc.

ker had found a home, but Hogan continued to twist and squirm. He looked around, tried to grin and mouth, "It's all right," but his effort to lie was useless.

"Wing for the tarmac," Roche screamed.

"Not yet. We'll—"

"Wing in!" roared Roche. "They haven't even repeated that shell yet!"

Hogan nodded. Roche was boss of the ship. Nevertheless, he'd stick if Roche wanted him to. He felt that Roche understood this. He banked the crate, and as he did so, the wings moved out of vision of the Fokker above, which was just then leveling off.

With lips penciled into a grim line, Roche blazed his Lewises into the belly of the Fokker. Instantly he saw it lift up as though it had settled on an exploding shell, and he knew that his message of hate and retaliation had reached its pilot.

Below, he saw a second mushroom of fire, smoke, and sand erupt from the summit of Hill 37, FM, but there was no second one twenty feet off longitude. Roche was puzzled. He gave no reply to that repeat shot, and Hogan continued to gun toward the tarmac of the 53rd Observation Squadron

The 53rd appeared to be a dirty, oily, greasy little group of buildings stuck up for no reason at all. The pilots and greasemonkeys of this outfit added to the impression, for greaseballs sat at ease on oily crankcase pans, suits black with caked oil, hands smeared, and hair too wild for even crows to nest in. The pilots were worse than the greaseballs. They appeared perfectly at ease wading through a mass of dirty and oily old newspapers for pictures that had appeared in print months before.

It was not the ideal type of squadron, but to the pilots of the 53rd it was a landing field, and even a dirty tarmac is a good spot to call home after a flight in a wind-bucking, wing-crying Salmson.

Once it had been the pride of the A.E.F., not for cleanliness, but for Kraut-killing efficiency. That had been in the days before Major "Pop" Fielding had been wounded by a piece of shrapnel, and before the 14th Artillery Base had gone crazy enough to use two or more guns.

WHEN Hogan brought his crate down before the apron of the hangars, Captain Chuck Roche leaned forward, thrusting his oily helmet to the back of his curly head. He was a young man, thin-featured, blue-eyed, with serious lines of premature age all over his face.

"Windy," he asked, anxiously, "are you hurt bad?"

Windy Hogan snorted contemptuously. "Uh course not. They haven't got lead enough in Germany to hurt me bad. Come on, give me a paw and I'll lumber out of here. Damn incendiary slid down my spine under the skin," he explained, "and the acid is burnin' like the devil. That's all."

All? That acid might cause him any one of a hundred agonies, from blindness to death.

"I've heard you laugh right out loud when you've had one foot inside the pearly gates," Roche said, respectfully. "But taking an incendiary lightly is not good sense. Come on, we'll get to Pop's medico on the run!"

That was the way those two got along. Roche had always respected Hogan's nerve, and Hogan, always imagining he was looking at a future C.O., respected even the powder burnt air that Roche breathed. They

were inseparable.

A greaseball was running toward them, eyes wide, mouth gaping. Roche and Hogan halted in their tracks, and Hogan heard Roche breathe a one-word prayer.

"The C.O.? He's not—" Roche grabbed the man's shoulder.

"Not yet. But the medico says he can't live twenty minutes longer. Too much poison from that shrapnel for his system. He's unconscious, but he left a message for you, Roche. He said he hopes you made a symphony ending for that Boche dump!"

Roche's eyes met Hogan's. They hadn't made a symphony ending with that dump. Roche felt that he had let the Old Man down at this hour when he should have stood beside him. It was those damned guns of the 14th! He cursed them bitterly.

The greaseball continued, "He says he wants you to carry on after he's gone. He hates the idea of G.H.Q. sending some pursuit pilot down here to fill his shoes. He says the smell of a pursuit pilot on the tarmac would make him turn over in his grave."

Roche nodded, but his face was taut. His eyes again met Hogan's, and the look passed between them was a bitter acknowledgment that they had failed the C.O.

At that instant both were dimly aware of a reverberating drone above them. They looked up to see a plane swooping down over the tarmac, cutting off against the wind. It rode in for a landing, skidded about and rolled to a stop before the apron of the hangar. They watched a pilot dismount from the rear pit, while an artilleryman unhoused himself from the fore. Both looked at the two men from the 53rd, and started forward immediately, faces flushed.

Roche sized up the pilot from the newly-arrived airplane. He was a big man, heavy-set and powerful. His appearance was brusque and dominant, his eyes sharp. His shoulder ratings were hidden beneath his tunic, but he walked like a general and was at least a colonel.

The sight caused Roche's heart to sink. Was this the man who would take the C.O.'s shoes when the latter passed on? It looked so. But the artilleryman—what of him?

"ARE you the pilot who was out over Hill 37, FM?" demanded the man abruptly, addressing Hogan.

Hogan shifted uneasily on his feet. The incendiary pressing against his spine numbed his senses with pain,

yet he managed to nod that he was.

"And you returned without bringing about a direct hit, didn't you?" The officer's sharp, smarting words shot over the tarmac loudly.

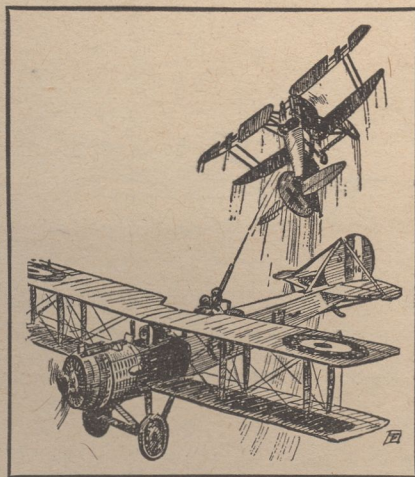
Hogan remained silent.

"And that is the way you always return!" continued the officer, unbuckling his tunic. "Why, I'd rather stay out there and be shot down than return without letting the 14th Artillery plant its shell."

"We stayed as long as we could," Roche broke in, stepping forward. Though his tone carried respect, it was nevertheless hard and firm. "But when the 14th began firing two guns, there wasn't a damn thing we could do. Our signals got mixed up, and—"

"Two guns?" roared the new officer. "You are an idiot! I was at the 14th all the while. Your report to G.H.Q. for over a week now that the 14th was firing two guns made them doubtful. They knew that something had gone berserk, so I went up there to watch this

(Continued on page 67)



FLYING ACES PICTORIAL FLYING COURSE

ACE MCCOY YOUR INSTRUCTOR

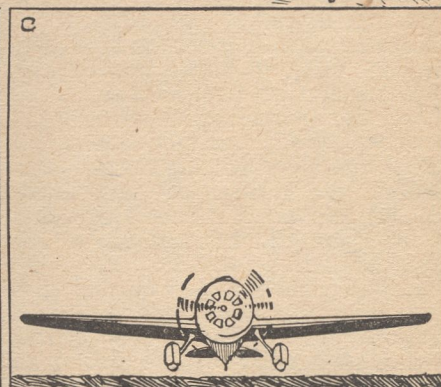
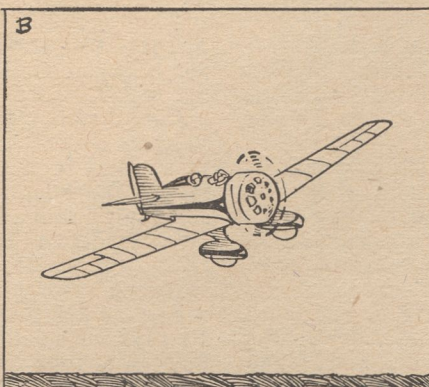
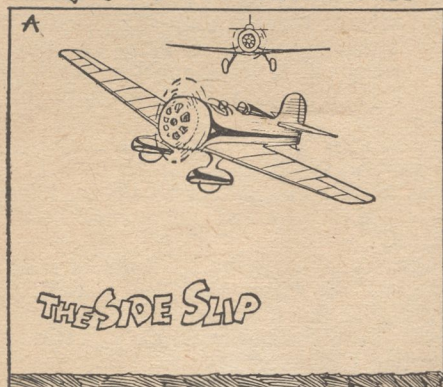
LESSON NO. 22.



ACE ---
WHY DO MOST RADIAL
ENGINES HAVE AN
ODD NUMBER OF
CYLINDERS ?

BOB CROWELL - DES MOINES

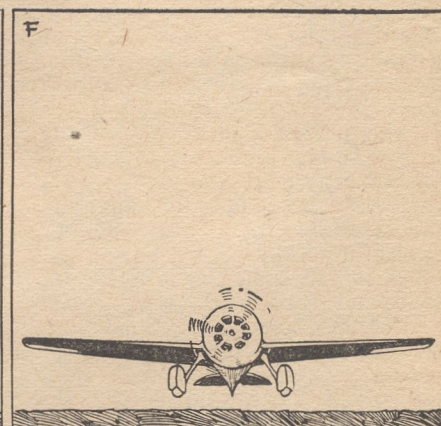
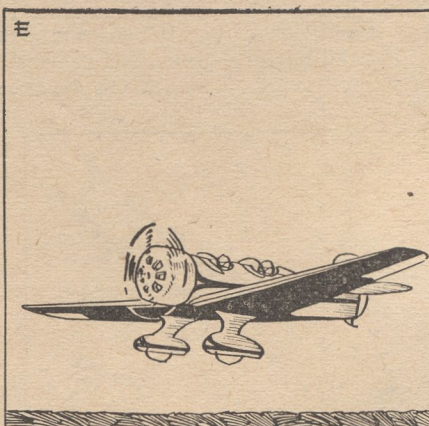
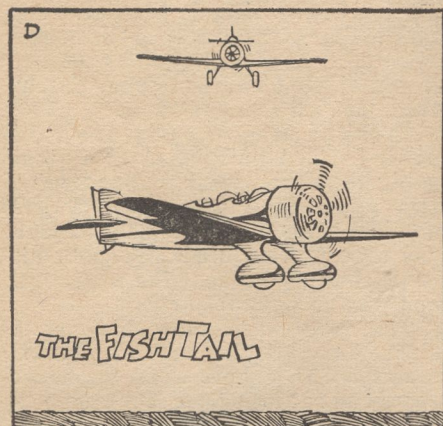
IN ORDER THAT ALL CYLINDERS
MAY FIRE IN PROPER ORDER
IN THE TWO REVOLUTIONS OF
THE CRANK SHAFT



Three Short Landings—First, The Slip: General Mitchell, a great war pilot, tells how he and two of his officers landed in a small, hazardous field.

The General came in high, with a latitudinal glide of 12 degrees. He dropped his left wing down, then kicked her over and dropped his right wing.

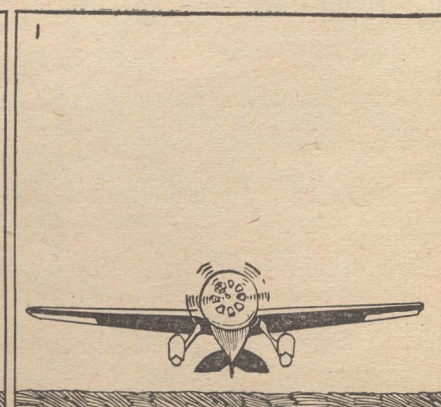
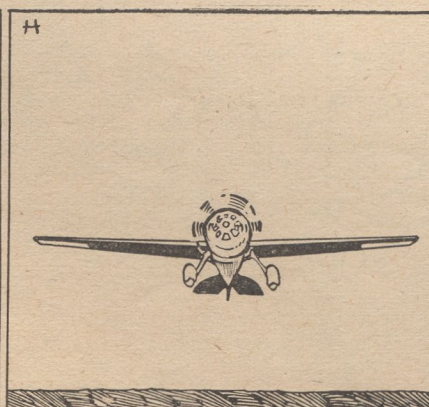
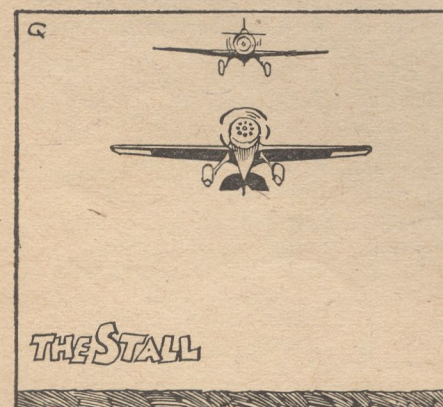
He landed in the dinky little field using his right-and-left slip, rolled a short way, and stopped with space to spare. The General is a great slip artist.



Second, the Fish Tail: His First Officer came flying in at a safe, gliding angle to the border of the field, and with his wings level, he kicked left rudder, causing the ship to yaw—or fly almost sidewise.

Then, holding his wings level, he kicked right rudder, and she fish-tailed the other way—thus, he quickly lost all flying speed.

He dropped to the ground, and with a short roll he brought his ship to a stop in almost the same space in which the General had stopped. Then he taxied to make room for the Lieutenant.



Third, the Stall: The Lieutenant was an expert at stalls—or “pancaking.” He could make his ship settle into a very small space at slow speed by approaching the field in almost a stalling position.

Once over the field, he stalled his plane in, much as a sea gull lands on water. With his tail skid below his wheels, he dropped to the ground, rolled a few feet, and stopped.

So there you have the three trick “short landings.” They’re all good to know. It’s a matter of opinion which is best. But your old friend, Ace McCoy favors the one used by the General—the slip.

Raid on the Polish Corridor

THRILLING STORY BEHIND THIS MONTH'S COVER

By C. B. Mayshark

★ ★ ★

IT is nearly 2 a.m. in the City of Danzig, and the atmosphere of quiet, common to that hour, prevails. The city's population is asleep; there is little activity other than the measured steps of the guards and sentinels at the military encampments and fortifications. The night is clear, and a soft, yellow radiance, cast by the moon, is playing over the cold, grey walls of the century-old buildings. Here and there, the darkness is punctuated by the brilliant pin points of the city's remaining lights.

It is difficult for one to visualize the fact that this peaceful and slumbering city is one of the storm centers of European diplomatic wrangling. Nazi Germany believes that the city rightfully belongs to her, and if she can't get it by vote, very likely she will resort to force. Votes, thus far, have failed her.

SUDDENLY an operator on a sound detector at a military flying field springs to attention. Adjusting his earphones, he tunes his instrument to maximum efficiency. Quickly jotting down his observations, he calls a runner and dispatches a note to his superior. A hurried order is broadcast, and a Polish squadron of single-seaters roars into action.

They arrive over the city at a speed of more than two hundred miles per hour—just in time to meet a flight of huge, tri-motored German converted bombers. The Polish pilots must act quickly if Danzig is to be saved. Already, the German ships have begun to drop their deadly eggs, and to make matters worse for the defense ships, a devastating anti-aircraft fire has been leveled at the invaders.

There is a contention among military authorities that it is impossible to completely destroy a city with one air raid, and that one bombing expedition will only serve to bring on a reciprocal one, thus prolonging the warfare. Very likely this logic is good, but it is doubtful if it is applicable in the present case. Danzig, a free city, is under the protectorate of the League of Nations—a body that would find it difficult to conduct retaliatory air raids against Germany. If Germany were successful in taking Danzig by force, she might have a chance of getting away with it, because Poland no longer depends entirely upon that city as a seaport, having recently built her own port at Gdynia, which is located at the Baltic end of the Polish Corridor.

On the other hand, a German air raid on Danzig might only constitute a move to throw Poland off her guard. Once a few bombs were dropped on Danzig, the Nazi bombers could continue southward to attempt devastation of the whole length and breadth of the Polish Corridor.

However, it is logical to assume that Poland would spring to the assistance of Danzig in the manner we have pictured on our cover. Poland, naturally, has an interest in the welfare of Danzig, for she is responsible for the city's relations with foreign countries. And then, if the German ships were to jump across the border into the Corridor, Poland would find herself in a position to repulse the attack if she had sent defense ships into the air at the first warning of impending danger to the City of Danzig.

And so, with the shrieking of shrapnel and the whine of machine gun bullets the populace of Danzig is awakened with a start of horror. The flight of single-seaters is knifing down to the attack with a vengeance, and the

formation of the bombers is temporarily broken. As a rain of tracer is directed against the first German ship, the Polish single-seaters swerve to the side abruptly. Bombers always have been difficult to shoot down, and the defense pilots are finding that their fire is ineffective. It is hard to find a vulnerable spot on such a large surface as that possessed by a tri-motored bomber, much less crash it to the earth with a single burst of bullets. As the defense ships roar in, the anti-aircraft fire abates somewhat in order that the defense ships will not be endangered.

Like a pack of yelping dogs, the gull-winged fighters cut loops of fury in the night sky. Three or four converge on one bomber, and after repeated thrusts it goes down, to crash with a deafening concussion on the earth below. And now two fighters follow it, victims of streaming lead from a vengeful bomber.

The Nazi bombing group now re-forms quickly. With the single-seaters still yelping about their ears, they climb for altitude and leave the city.

What is their purpose? Will they continue on and destroy Gdynia? Or are they merely temporarily pulling away from the scene of battle in order that they can reorganize and return in a short time to finish the job which they have only begun?

The scene that they leave behind is not pleasant to look upon. Everything is stark horror on the streets of Danzig. Mutilated bodies and piles of debris lie grotesquely about the city. Police emergency squads are carrying the wounded and dying to hospitals, and the streets are being cleared of the wreckage. Already, the work of rehabilitation has begun.

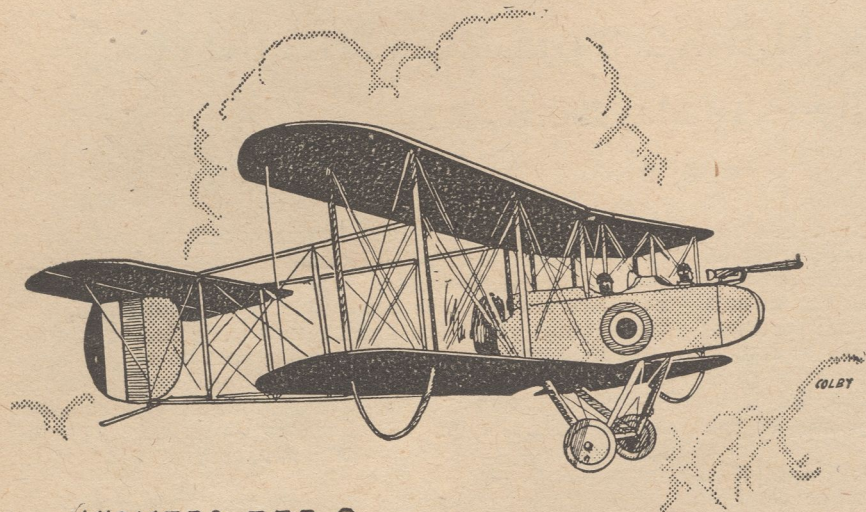
Everything being considered, Danzig has not suffered as badly as one might imagine. Comparing the potential destructive force of each bomb dropped, with the actual damage done, it is not difficult to share the belief that it is well nigh impossible to completely annihilate a sizable city with one raid.

And so, Nazi Germany has started on a rampage of conquest, fictitiously, of course. And thus history repeats itself. Governments whose positions have become jittery and insecure domestically have almost invariably attempted to excuse their existence by a successful campaign for territorial annexation. In the long run, however, such governments are doomed to destruction.

THE German ships pictured on this month's cover are Junkers JU. 52/3m's. They are tri-motored bombers capable of making 177 miles per hour and having a disposable load of 8,360 pounds. They are powered with three B. M. W. "Hornet" T. I. C. engines. Of course, these planes were designed for freight and passenger service, but the job of converting them into high-efficiency modern bombers would require only a few hours. As a matter of fact, it has already been done, and one ship has been named the "Baron Manfred von Richthofen."

The Polish ship used is a P.Z.L. P-XI with a Bristol Mercury IV.A. radial engine fitted with a Townsend low-drag ring cowlings. It has a high speed of 217 miles per hour. Poland is known to possess several types of remarkably efficient ships, and the strides she has made in airplane manufacture is all the more remarkable in that every ship in service in that country is of Polish manufacture.

War Planes Album



VICKERS E.F.B. 9

THE VICKERS E.F.B.9.

THIS machine is not unusual for the 1916 era when the British were attempting to overcome Herr Fokker's monoplanes that were the first to be fitted with fixed guns synchronized to fire through the whirling blades of the prop. Vickers was not alone in this design, for De Havilland and the Royal Aircraft Factory had done much with the Farman-type biplane.

This plane, much like the F.E.2b., except for the motor and steel-tube

tail booms, was a light and fairly fast two-seater. The pilot sat under the leading edge of the top wing and the gunner-observer had the open nacelle in front. A Vickers mounting, carrying an early infantry-type Lewis gun, was the only armament carried—the pilot had to be content to sit and take it. On the latter "Fee," the pilot could use the gun set between his cockpit and observer, provided he hunched himself up into an almost-standing position. On the other hand, the "Fee" gunner could use this gun to fire at an angle over

his top plane, in case they were attacked from behind.

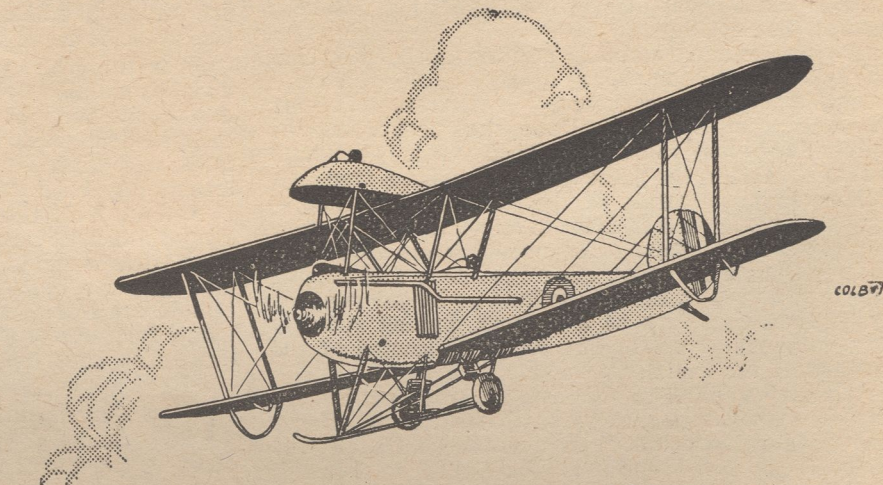
In the Vickers pusher, shown here, they used the old 100 h.p. Monosoupape-Gnome rotary engine and under forced draft could probably get 95 m.p.h. top. They had fuel for a three-hour patrol and up to about 12,000 feet the ship handled well in maneuvers. Actually, this was one of the toughest ships in the world—to get down. Regardless of what they might say against the old pusher biplane, they were remarkable for their structural strength. They could fight for hours and return with almost everything dangling, but they could always be flown and landed. They had one bad drawback—that was the all-too-frequent business of the props coming off and cutting all the tail booms away. Authorities on World War air action declare that it was the Vickers Fighters that first stopped the early Fokker monoplanes fitted with synchronized guns. This ship, known as the E.F.B.9, is said to have been the first plane on which a real machine gun was mounted with successful fighting results. By this, we mean the first ship to carry a machine gun into action and actually score. Prior to this, on the Allied side at least, machine gun mountings were too frail, too heavy, or set in such a way that they were not really efficient.

THE VICKERS F.B.11.

THIS aerial monstrosity was actually built and flown (but not on active service) during 1917. It is listed in the record books as the F.B.11 and was another gallant attempt to use up all the old parts that had been left over from the 1915 era.

The most astonishing feature of this ship is the aerial bathtub mounted forward and above the center-section and intended for something in the way of an aerial fighting top. We must presume, of course, that a gun was mounted up there and that the gunner carried a rope or folding ladder to reach his turret, for no amount of examination of the original photograph gives us any idea how one clambered in or got out. Of course, they might have cut some notches in the prop.

The second startling feature of this ship is the unusual gap between the upper and lower wings. While we have no official figures on the machine, it is evident by general comparison that the interplane struts must have been at least ten feet and possibly twelve feet in length. The undercarriage flaunted the old Avro single skid arrangement and oleo shock absorber boxes. The old wicker



VICKERS F.B. 11

wing-tip skids are also noticeable decorations.

In general, the F.B.11 was an equal-span wire-braced biplane of large proportions. There was considerable dihedral to the wings, and ailerons were carried on all four wing-tips. The motor used was the big Beardmore. The top speed, fully loaded, was 96 miles per hour.

It should be added that this machine was originally designed as a fighting bomber, and we must presume that the bomb load was carried

in the fuselage, as no bombs or torpedoes could be dropped from a center rack owing to the general arrangement of the undercarriage and its skid. Wing racks could have been fitted, but none are shown in our photograph.

To handle all this there must have been a third member in the crew, for it is not likely that the penthouse gunner could release bombs from his perch.

War certainly is terrible—on the designers.

During the war, Vickers Ltd., of London, went into the aviation game and developed some startlingly good machines—like the Vimy and the F.B.16 H. fighter. Vickers also put out some astonishing craft that were among the most unusual ideas of that rare age. We offer several Vickers craft this month, two of which we believe have never been published before in this country. Here they are, buzzards — the Vickers E.F.B.9., Vickers F.B.11., Vickers F.B.12.C., and the Vickers Vampire. And while we're on the subject, let us tell you that Vickers is one of the greatest aero firms in the world today.

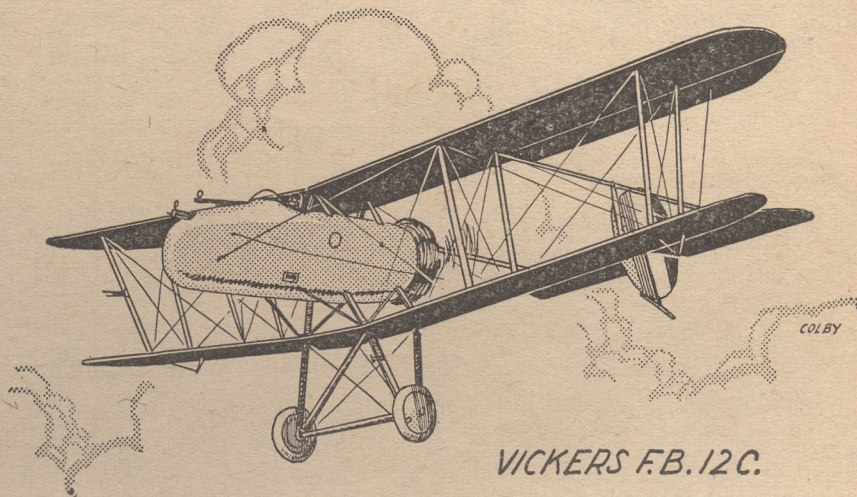
THE VICKERS F.B.12.C.

HERE'S another of the strange Vickers line which came out early in 1916 when the British were trying to find an answer to the forward-firing gun problem. While an R.F.C. sergeant had designed the early Kauper gear for the British and the Scarff-Dibovsky gear was still being tried out, nothing practical was developed until George Constantinesco, a Roumanian, devised the hydraulic gear which is still in use in many countries.

Meanwhile, British designers were trying to make the most of pushers where they could stick a Lewis gun out the front and let the pilot worry about his engine dropping on his back in case of a bad landing.

This F.B.12.C. ship will at first be mistaken for the old Vickers Vampire, but it is an earlier model of that type, and a close inspection will show that the nacelle is much longer on this machine. Moreover, the general strutting arrangement of the undercarriage is different. This machine had but one Lewis gun whereas the Vampire was equipped with two. (Compare with the Vampire, shown below.)

The F.B.12.C. was a pusher biplane, built with the upper wing



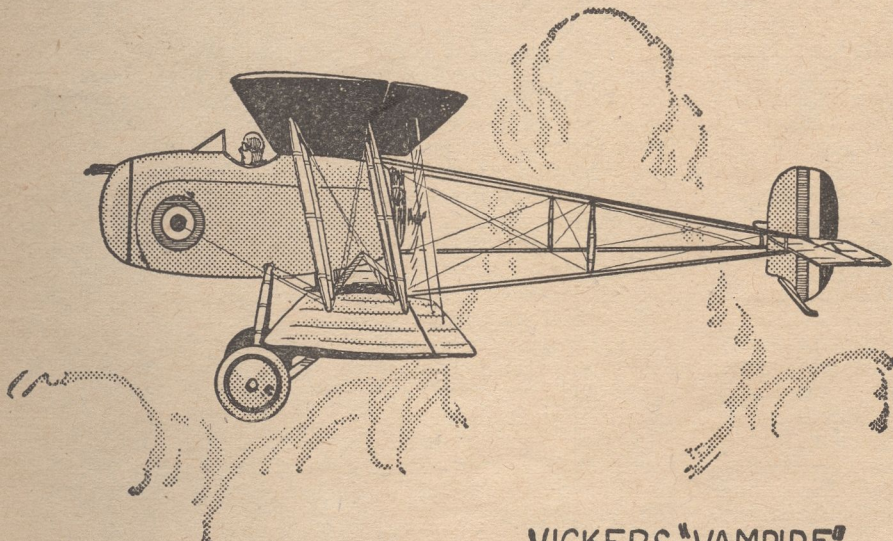
VICKERS F.B.12.C.

carried on short, Vee-pylon struts set over the nacelle. There were two sets of interplane struts on each side, and owing to the chord of the lower wing being narrower than the upper, the struts had to be set slightly splayed out to connect with the main spars. The outer set also tilted outward toward the upper wing-tip.

The motor used in the F.B.12.C. was the 80 Le Rhone which gave the ship a top speed of 103 below 10,000 feet. Like the D.H.2., it was a splendid fighter model offering good forward

view, a wide range of maneuverability, and in addition gave the pilot a certain amount of protection when the motor happened to be blocking off enemy bullets, once Jerry was on the tail.

There is no record anywhere to give evidence that this machine was ever used on the Western Front, but a number were used later in 1917 on several of the Mesopotamia fronts and in Egypt. The modern Hanriot pusher has many of the features incorporated in this old war model.



VICKERS "VAMPIRE"

THE VICKERS-VAMPIRE

NOW let's take the Vickers-Vampire, an excellent ship that came out during the last few weeks of the war. Here we have the usual single-seater pusher ship, powered with a Bentley rotary engine of 200 horsepower. There were many ships of this general design sent out to the Front during 1915-16 and even in

1917. Yet when it seemed that this nacelle-type pusher had seen its best day, the Vickers Company pops out with one of the finest ships that ever was put on ground and trench strafing.

The Vickers-Vampire was designed mainly for low-altitude work. It was protected in the important spots with much armor plate. As a matter of fact, it carried no less than 500

pounds of the bullet-proof material. The nacelle or body, as may be seen, carried the pilot, who just about sat on the floor. In front of him were fitted two Lewis guns which could be fired individually or together from a cable control on his joystick. The nacelle was built up close to the lower side of the top plane, while short metal struts, much like those beneath the fuselage of the Bristol Fighter, connected the body with the main spars of the bottom plane. It had the usual V-type chassis or undercarriage, and the axle rode in loops of coiled rubber.

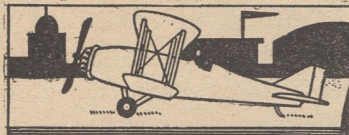
Below the 1,000-foot mark the Vampire was capable of 121 miles an hour fully loaded. At 10,000 feet it could do 115, and it landed at 54 miles an hour. It climbed the first 5,000 feet in 5 minutes and did 10,000 feet in 12 minutes.

The tail was held on with four metal booms and the propeller, a four-bladed affair, swung between these booms. The planes were supported by two bays of struts on each side. It had a high radius of action.

It is interesting to note that many of the European nations have taken many points from the old Vampire and put them to good use in their modern war planes.

HAPPY LANDINGS

BY ARCH WHITEHOUSE



Douglas Puts It Over . . . Speed Going Up? . . . Robot Craft Again . . . Light Plane Clubs

What does Designer Douglas say about power plants and safety? Will our planes approach the speed of sound? What is the American attitude about robot planes? And how about boosting the light plane ranks? In this department, where Mr. Whitehouse has free rein to express his personal views, these interesting questions are discussed.

✱ ✱ ✱

EVERY year an aeronautical event of major importance is staged in Great Britain by the Royal Aeronautical Society. It is known as the Wilbur Wright Memorial Lecture—a tribute to one of the two American brothers who first flew a heavier-than-air machine.

This year, the chief paper was read by Donald W. Douglas, the noted American aircraft designer. Hence, though the feature was held in England, it was something of an All-American event. The British press took kindly to it, too; but so far we have not been deluged with reports on it in the American papers, proving again the old adage about the prophet in his own country.

In fact, Donald Douglas's speech was undoubtedly one of the outstanding events of the past five years, and the British aeronautical designers were more than glad to listen. The fine showing of the American Douglas transport in last October's England-to-Australia race still lingers; and while the routes flown by Imperial Airways are not yet ready for ships of the Douglas type, there is every reason to believe that their future designs will incorporate many of the ideas established by Douglas.

Douglas explained that in the case of multi-engined planes, the performance after engine failure should be regarded as a definite problem of design. In other words, the fact that a ship has three or four engines is no assurance in itself that the machine is safe or correctly put together. If one or two motors cut out, the ship should be able to continue on to safety; but unfortunately this is only theoretical, and until designers discover the trick of making a ship fly in true safety when only one wing motor is running, all the speed ideas in the world are not worth the paper they are written on.

Douglas maintains that the maximum of safety and reliability is reached with a four-engined ship which requires but one engine to maintain a given altitude. Next in order comes the three-engined job requiring one, followed by the four engined ship that requires two.

Douglas points out that the first two goals of designing mentioned above are practically unobtainable, if any real pay load is to be carried. For instance, it will be seen that in a ship carrying four engines—two side-by-side on each side of the fuselage—the failure of all except, say, the outside port or starboard engine would cause plenty of trouble. It would be almost impossible to get a design that would not require a wild angle of yaw to stay in the air at all. The same situation arises in the three-engined ship where the center and one outside engine cuts out leaving the work for the remain-

ing outside power plant—meaning excess strain plus!

The two-engined ship of clean design—whether it be monoplane, biplane, or triplane—is the best compromise, according to Mr. Douglas. The ship must be able to move forward at approximately zero angle of yaw, even with but one engine, and to get this quality, one must have clean aerodynamic design and vertical surface of low drag with the rudder deflected. It is also important that under these conditions there must still be sufficient rudder control to handle the ship in other emergencies.

Actually, the wide-winged monoplane of the Douglas type offers the best base for such design inasmuch as it gives a wide wing-span and allows placement of the motors as near the center line of the machine as possible. Here, too, the motors should offer as little drag as possible, and if variable-pitch air screws are used, the pitch of the blades should be changed so that the edges of the blades point forward on the motor that is not running. The most important point in the explanation was that ceiling is of major importance in the performance of a ship under these power-loss conditions in order that natural and artificial obstacles on the plane's route may be cleared.

Mr. Douglas also displayed his new rapid parameter and chart method of predicting the performance of a multi-engined ship when a certain percentage of power is lost. His method won considerable interest among the British designers. It is said to be comparable in accuracy with actual flight test measurements.

Mr. Douglas gave the British designers an earful, and they appreciated it so much that his highly technical paper has been printed in leaflet form and will be distributed by the Royal Aeronautical Society.

A very sporting gesture on both sides. Let's have more of this sort of thing—and less of the so-called secret-list stuff which we've been gorged with during the last few years.

SPEED GOING UP?

IF we are to put faith in the experimentations of the wind tunnel merchants, the maximum speed of the airplane (which is now something around 440 m.p.h.) is in for some hair-raising accelerations. At Langley Field, Va., they have a new wind-tunnel that enables testing of ships that would make (theoretically) about 500 m.p.h. At the same time, our newspaper-clipping scouts abroad send us the information that the British have built a new tunnel at the National Physical Lab-

(Continued on page 56)

Here and There in the Air

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

TIPPING THE SCALES

THE remarkable accuracy achieved by aeronautical engineers in estimating airplane weights from nothing more than layouts and drawings is shown in a study of calculated and actual weights just released by the Boeing Aircraft Company of Seattle.

In the case of the original Boeing 247, the calculated empty weight was 8,161 pounds. On being weighed, the actual plane tipped the scales at 8,174 pounds. Calculated empty weight for the Boeing 247-D transport was 9,200 pounds, and actual empty weight, 9,144 pounds. The Boeing Y1B-9A bomber's calculated empty weight was 7,455 pounds, while the actual empty weight proved to be 7,495 pounds. Similar close calculations were made on previous models.

In the preliminary design of a new Boeing model, engineers first lay down weights of the plane's principal units such as wing, body, landing gear, tail, wheel assembly, etc. Groups then are further broken down into detailed parts. In order to keep weights within the original estimate, parts must conform to design weights or must be redesigned. Weight estimators work from tabulations of materials and weights which have been compiled over a period of years. These show the weights of different materials per square inch and per lineal foot. Also shown are weights of all standard parts such as bolts, nuts, screws, washers and cotter pins. In the case of new material, weight information is obtained from samples.

TO THE RESCUE!

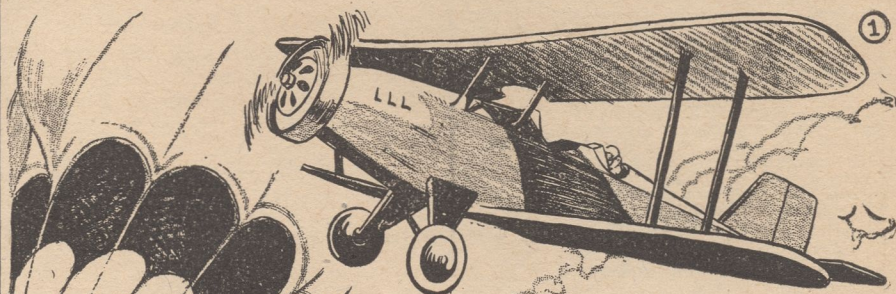
SIX pilots of the 26th Division Aviation, Massachusetts National Guard, recently had occasion to demonstrate their devotion to duty when they hurriedly left a testimonial dinner in Boston to rush, with screaming motorcycle police escort, to their flying field to start out on a rescue mission.

An emergency call, telephoned by the Boston police to the effect that two boys had been reported adrift on an ice floe in Dorchester Bay, was the summons that sent them aloft, in zero weather, in an effort to find the missing boys. In spite of huge flares and wing-tip spotlights, and their scanning of the entire questionable area of the bay from an altitude of less than a hundred feet, the boys were not found. Thus it was decided that the original report had been made by one of the ever-alert, trouble-making "false alarm" tribe.

Earlier in the same day, incidentally, some of the same flyers had been on a rescue mission dropping food and other supplies to a party of fishermen, ice-bound on Muskegat Island.

PILOTOPICS

By ROY HUMPHRIES

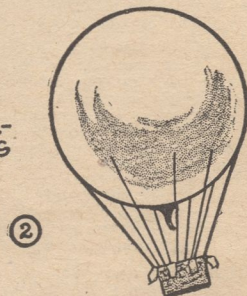


PILOT HOLDS PLANE MOTIONLESS IN AIR FOR ONE HOUR. . .

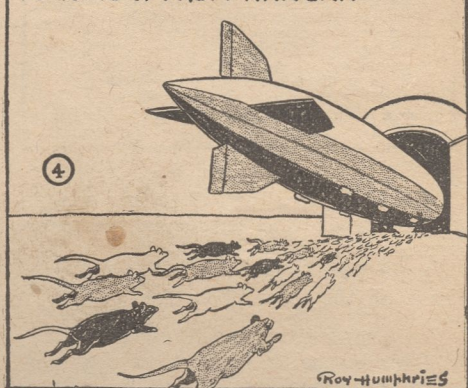


MONKEY PARACHUTE 'JUMPERS' TEST MILITARY 'CHUTES. . .

HOW THE BAL-
LOON GOT ITS
NAME. . .



RATS ATTACK BRITISH DIRIGIBLE
FORCING IT FROM HANGAR



Stories Back of the Above Pictures

1—In 1929, Howard Stark, Chicago air mail pilot, conducted an experiment in suspended animation that would have puzzled many a scientist of an earlier day. At an altitude of 3,000 feet, he held his plane absolutely stationary for more than an hour by throttling down his motor while bucking a sixty mile-an-hour gale over the windy city.

2—In 1783, the Montgolfier brothers, who were making experiments with lighter than air craft, christened their new contraption "balloon" because it resembled the round bottle of that name, used in chemistry.

3—"Monkeybusiness." The Japs have a use as well as a word for it. Selected simians, trained by Nipponese Army fliers to pull the ripcord that opens a parachute, are tossed from planes at different altitudes to test new types of 'chutes. If the monkey lands safely, the 'chute is considered O.K.—if not, the monkey is no longer O.K.

4—Rats attacked the British dirigible, R-100, while it was under construction at Howden, England, in 1929. Even the Pied-piper of the Air Corps Band could not dislodge the rodents, so the huge airship was hauled from its hangar and became the locale of a general rat hunt to prevent the creatures from destroying the fabric of the gas bags.



WISCRACK-UPS



Taxi in on this runway and pick up a plane load of laughs! In this department, we present a collection of jokes, cartoons, and humorous verse. For all original contributions which we can use here, FLYING ACES will pay \$1. No contributions will be returned unless a stamped, self-addressed envelope is enclosed.

THE BALLAD OF A BRISTOL

There's a good half dozen buses
On which I've done a whack,
From the R.E. 8 to the three-ton weight
Of the lumbering old big Ack;
On a rotary engined Avro
I've attempted several tricks,
And I'm quite a dab at steering a crab
(Better known as a D.H. 6).

And many a first rate joy ride
Have I had on them, first and last.
And many a strut
Have I had go phut,
And many a wheel tire burst;
But none of 'em knows the secret
Of making my heart rejoice
Like a well-rigged Bristol Fighter
With a two-four-six Rolls-Royce.

She leans at her place on the tarmac
Like a tiger crouched for a spring,
From the arching spine of her fuselage line
To the ample spread of her wing.
With her wires like sinews tauted
And her tail-skid's jaunty twist,
Her gray cowed snout juts grimly out
Like a tight clenched boxer's fist.
Is there a sweeter music,
A more contenting sound,
Than the purring clomp
Of her broad curved prop
As it gently ticks around?

Open out her crescendo
To a deep toned swelling roar
Till she quivers and rocks
As she strains at the chocks
And clamors amain to soar.

Whisk her away my hearties,
Taxi her into the wind,
Then away we spin on a skimming rim
With the tail wheel well up behind;
Hold her down to a hundred,
Then up in a climbing turn
And off we sweep in a speckless sky
Till we catch a breath of air, Alp high;
I wouldn't exchange my seat, not I,
For a thousand pounds to burn.

LOGICAL QUERY

Ex War Ace: And that, my son, is the story of your father in the great world war.

Son: Yes, daddy—but what did they have all the other pilots for?

THE FEELING'S MUTUAL

She: Please land me at the next airport. I'd rather walk than fly with a pilot like you.

He: If I could only land this crate, I'd walk with you!

WORRIED

A fat lady was taking her first ride in an airplane. When the ship began to move across the ground, the stewardess noticed that the fat lady lifted herself from her seat.

"What's the matter," asked the stewardess, "Isn't the seat comfortable?"

"Oh, the seat's all right," explained the fat lady, "but I didn't want to put my full weight down while the plane was trying to take off."

A G-DOG

One day, Phineas Pinkham was walking across the tarmac with his dog, Rollo, when Major Garrity approached.

Major Garrity: What kind of a dog is that?

Phineas: German Police! Haw-w-w!

Garrity: He doesn't look like one.

Phineas: Naw—he's in the Secret Service.

NUt

Pilot: Who's the craziest man you know?

Aero Engineer: The guy who tried to invert a rotary motor.

CONFUSING

Teacher: Harold, who invented the airplane?

Harold: Curtiss.

Teacher: Wrong. Wright.

Harold: Well, make up your mind.

SPOT LANDING

Mechanic: Look, there's Rockefeller on the field below us.

Pilot: Sure enough. Watch me land on one of his dimes!

LOVE BIRDS

1st Stude: Say, I hear our chief instructor married his first girl student.

2nd Stude: Yeah, love at first flight!

BAD START

Mother: Johnny, you always leave everything half done!

Johnny: Gosh! And I always wanted to be a trans-Atlantic flyer!

SILLY ADVICE

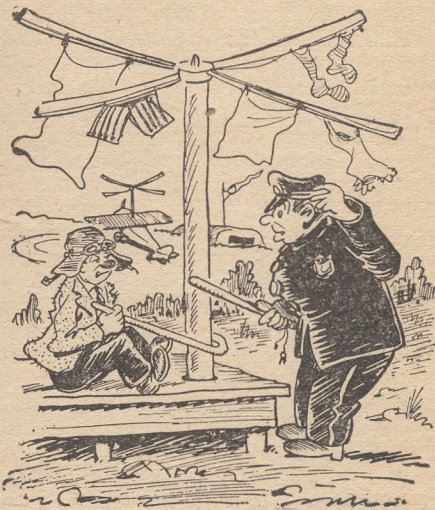
Instructor: Never do any stunts under three thousand feet.

Dumb Stude: Of course not. You'd be trampled to death under a crowd like that.

SLIGHT ERROR

"Look," said the nervous woman passenger in the stratosphere plane, pointing to the ground, "I think I dropped one of my pearl buttons off my jacket. I see it glistening down there."

"You are mistaken," said the pilot. "That's Lake Erie."



"Pardon me. Haven't you become a mite confused?"

HOW ABOUT AN AMPHIB, PHINEAS?

Pinkham: Say, what's the difference between a seaplane and a land plane?

Victim: Well . . . er . . . ah . . .

Pinkham: Well, a seaplane can land—but did you ever see a land plane that could sea (see)? Haw-w-w!

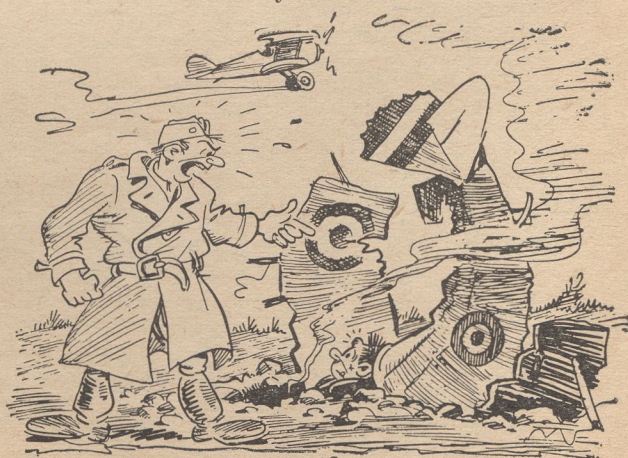
FINGERS O.K.

Flight Surgeon (to injured cadet): Well, I see you're holding your fingers. How many did you break?

Cadet: None, sir.

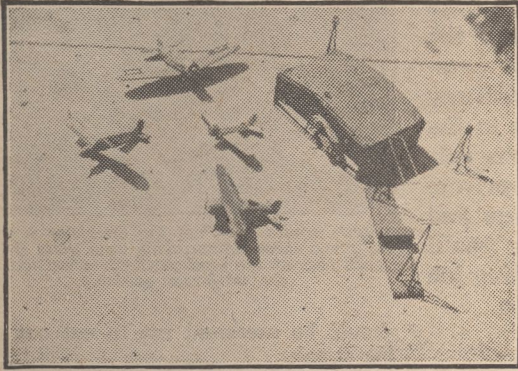
Flight Surgeon: Fine. Since you're all right, you may return to your quarters.

Cadet: But, sir, I wasn't as lucky with my neck.

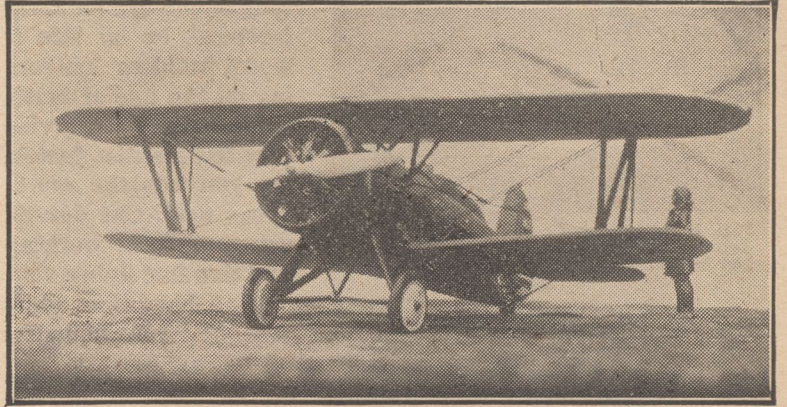


"You're Grounded!"

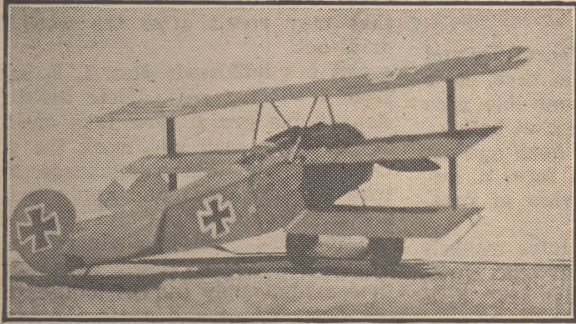
With the Model Builders



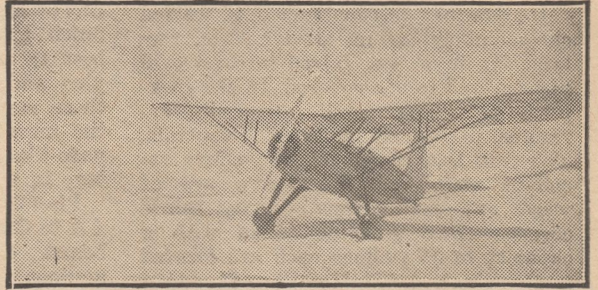
What more could you ask for? Fred L. Smith, of Union City, N. J., goes in for aviation in a big way. He's not satisfied with model planes. Here's his model airport, hangar, beacon, radio shack, and five ships to complete the deal. Can you name the four ships out on the tarmac? How's the airport business, Fred?



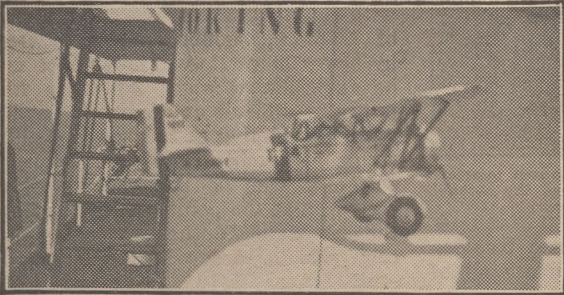
This one looks like the real thing, instead of a model—but we can always rely on Norman Sinclair, of Southampton, England, for a fine piece of work! Here's his version of a Boeing P-12E, flaunting the insignia of the 27th Pursuit Squadron. And this shows Norman still reads FLYING ACES, even though he's 3,000 miles away.



The ever popular Fokker triplane photoed from a good angle. Richard Stuart showed good design and good photography when he put his camera on this. There's a point for you model builders to remember when you "shoot" your craft. Dick flies his models out of Auburn, R. I.



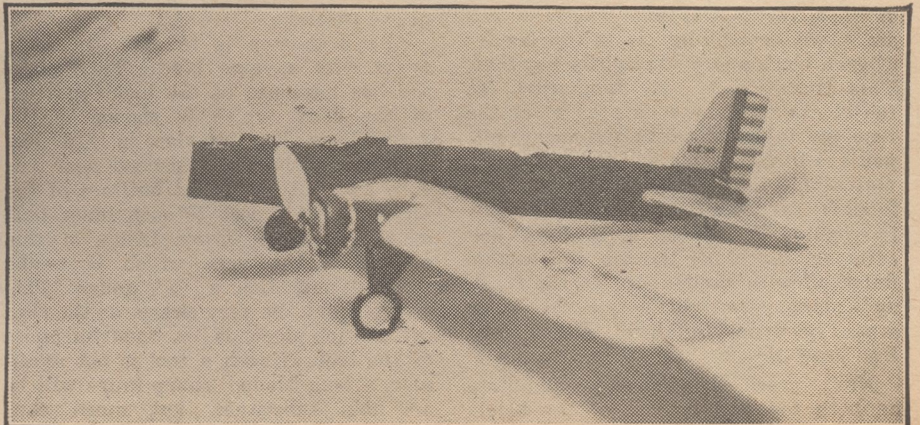
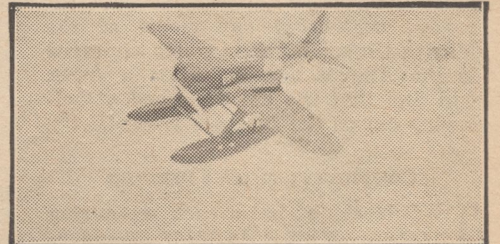
A Fairchild 22 credited with a duration flight of 32 seconds. It tips the scale at $2\frac{1}{4}$ ounces and was made by Wentworth Hollmeyer, of Wellesley Hills, Mass. The wing span is 24 inches and shows clean workmanship.



Above: This well-constructed Goshawk uses the S. S. Alabama, Texas Company tanker, for a carrier. It was built by Raymond Terry, radio operator aboard the ship. An unusual photograph, eh? Certainly looks like the real thing!

Right: Here's a mighty Boeing Bomber of the first series made by Jack Dettis, of Pittsburgh. Jack flies this ship by means of a set of pulleys and rubber-band belts from a main shaft in the fuselage. He says it flies well, too.

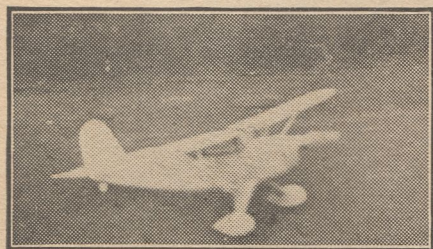
Right: Presenting a Seversky Amphibian built by Joe Margues, of Plymouth, Mass. It is fitted with full controls, landing lights, and the rest of the accessories. Its prop turns on an electric motor. Nice going, Joe!



MODEL FANS

Don't miss the article, "How to Get Good Model Photos." You'll find it on page 39 of this issue.

Here's The Rearwin Speedster



This is Harry Appel's original model of the Rearwin Speedster 6000. We'd say it's a plenty fast looking job, and those streamlined wheel spats certainly add lots of snap.

THE Rearwin Speedster 6000, from which our model is designed, is a fast, clean-cut two place, highwing monoplane for the sportsman pilot and private flyer. It is powered with a Hi-Drive Cirrus engine, four cylinder in line, air cooled plant, delivering 95 h. p. At a cruising speed of 120 m. p. h., it has a cruising range of 600 miles. Its top speed is 144 and it lands at 39.

Its fuselage is constructed of welded chrome molybdenum steel tubing, rectangular in shape, faired into an oval section, and fabric covered. In the cockpit, which is enclosed, are seats arranged in tandem with dual controls. The roof is transparent and offers excellent visibility. The wings are of wood and metal construction, fabric covered. Two gasoline tanks with a capacity of 17 gallons each are located in the wings. A 78" Hamilton Standard steel propeller enclosed in a streamline spinner cap is employed.

Our model, shown in the photographs, was constructed by Harry Appel, a well-known Brooklyn model builder. Here, we again employ the hollowed out type of construction because of its simplicity and ease. Those of you who have already constructed our model of the Martin Diving Bomber, which appeared in the August issue of FLYING ACES, will find that the same method of hollowing out of the fuselage is used.

CONSTRUCTION OF FUSELAGE

TWO blocks of balsa each measuring $11/16"$ x $2\frac{3}{4}"$ x $12\frac{3}{16}"$ should be selected. These blocks should be very smooth and soft, since no other variety of balsa for this type of fuselage will do. Apply cement lightly to the insides of each block and press lightly together. This operation is only temporary, as the blocks must be separated after the fuselage takes form. In the meantime, you are to make side and top view templates of the body and cut them out of flexible cardboard. Accuracy is very important. Trace the sides first, and after cutting along the top and bottom finish off with sandpaper. On the fuselage plans, you will notice the large scoop between Bulkhead No. 1 and Bulkhead No. 2.

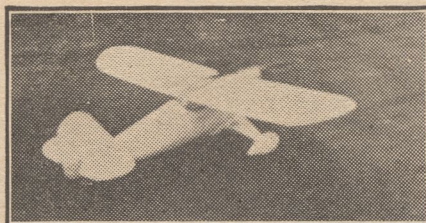
Next, trace the top view template on both top and bottom of the block.

This two-place, highwing Speedster caught our eye as ranking with the foremost, so on this trip into the model builders' hangar, we're passing up the line of bristling military ships we've been giving you in the past few months. Instead, we're taking you into the sport and private flying field. Cut out the plans and get your tools working—for you'll find this fast flying, fast landing job a handsome addition to your squadron.

By Jesse Davidson
and
Harry Appel

Cut away the excess wood carefully and finish by sanding. At this time, it is best to shape out the removable nose plug and spinner cap. See that both of these pieces, when placed flush against the nose of the fuselage, form a torpedo-like shape. See top view of fuselage in Plan No. 2.

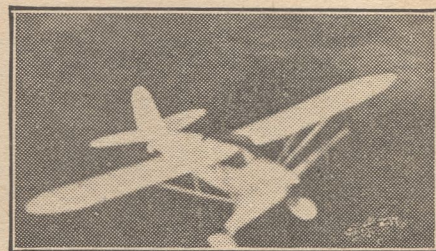
Plan No. 2 shows templates marked AA to CC which are cut out from cardboard. Each template is set flush against the sides of the body at the positions marked on the side-view drawing. Hold the body up against a strong



And here's how she looks from the rear quarter "slant"—a view which brings out the details of the empennage structure.

light, and if no light passes between the template and the outside wall of the body, you know that you have the correct oval shape. For accuracy, this procedure is followed with both sides of the fuselage.

The next step is to split the body apart with a razor blade. Then make another template of the inside portion of the body, which is shown by the dotted lines. This template is $1/16"$ less all around the body, except near the nose and tail ends. The outlines of the template are traced to each inner half of the fuselage forms. Inside of this outline is the area which is to be scooped out. Use a $\frac{3}{8}"$ gouge. This gouge should be very sharp, as the ease of the job depends on the sharpness of the tool. If such a tool is not available, a long bladed, sharp knife will be an able substitute, but much care



Here's a nice "shot" of the Speedster coming in for a three-pointer. This view gives you a good idea of the semi-cantilever wing and of the wing-root assembly.

should be exercised not to cut out too big chunks.

The walls are $1/16"$ thick all around, starting from B to just short of the tail end. Do the job carefully and take your time. When you have completed both halves, hold up to the light to detect any thick spots. These should be sanded down. Apply a good coat of banana oil to each part and sand the roughness that may result after the wood has dried out.

Cut out bulkheads Nos. 1, 2, and 3 from $1/16"$ flat balsa. Note the direction of the grain. Now take one-half of the body shell and mark the positions for each of the bulkheads. Next take the bulkheads and apply cement along the outer edges and place each one into the shell in their respective positions. When they have dried thoroughly, apply cement to the existing outer edges and along the center lines of the remaining shell. Place firmly flush to the other shell and wrap around with rubber bands or ribbon to hold securely until thoroughly dried. Later, remove the binds.

The cabin of this model is covered with celluloid. The frame work is made of $1/16"$ sq. bamboo, which is shown by heavy black lines. The bamboo must be curved two ways, which in itself is pretty difficult unless one is familiar with the shaping of bamboo parts. Two strips of bamboo $1/16"$ sq., shaped as shown in the top and side views, are cemented at the points where they meet the fuselage. To these strips, and on each side, a piece of balsa (the wing stub brace) $1/16"$ x $\frac{3}{8}"$ x $2\frac{3}{8}"$ is cemented. This is supported by vertical brace struts lettered X, Y, and Z which have the following dimensions: X— $1/16"$ x $1/16"$ x $\frac{5}{8}"$; Y— $1/16"$ x $\frac{1}{8}"$ x $\frac{5}{8}"$; and Z— $1/16"$ x $1/16"$ x $7/16"$. When these parts are thoroughly dried, use isinglass or thin sheet celluloid for the windows on the sides, front, and roof. This completes the fuselage.

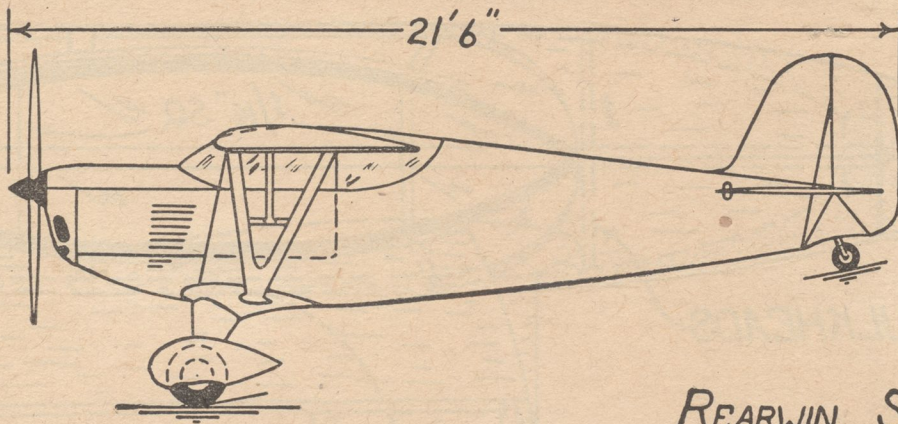
WINGS

PLAN No. 4 shows the left half wing.

By making a tracing of this half and turning it over on its back and re-tracing it, the right half wing can be made. The sizes of each member of the wing are given. Construct both halves in the usual manner. The ribs are cut

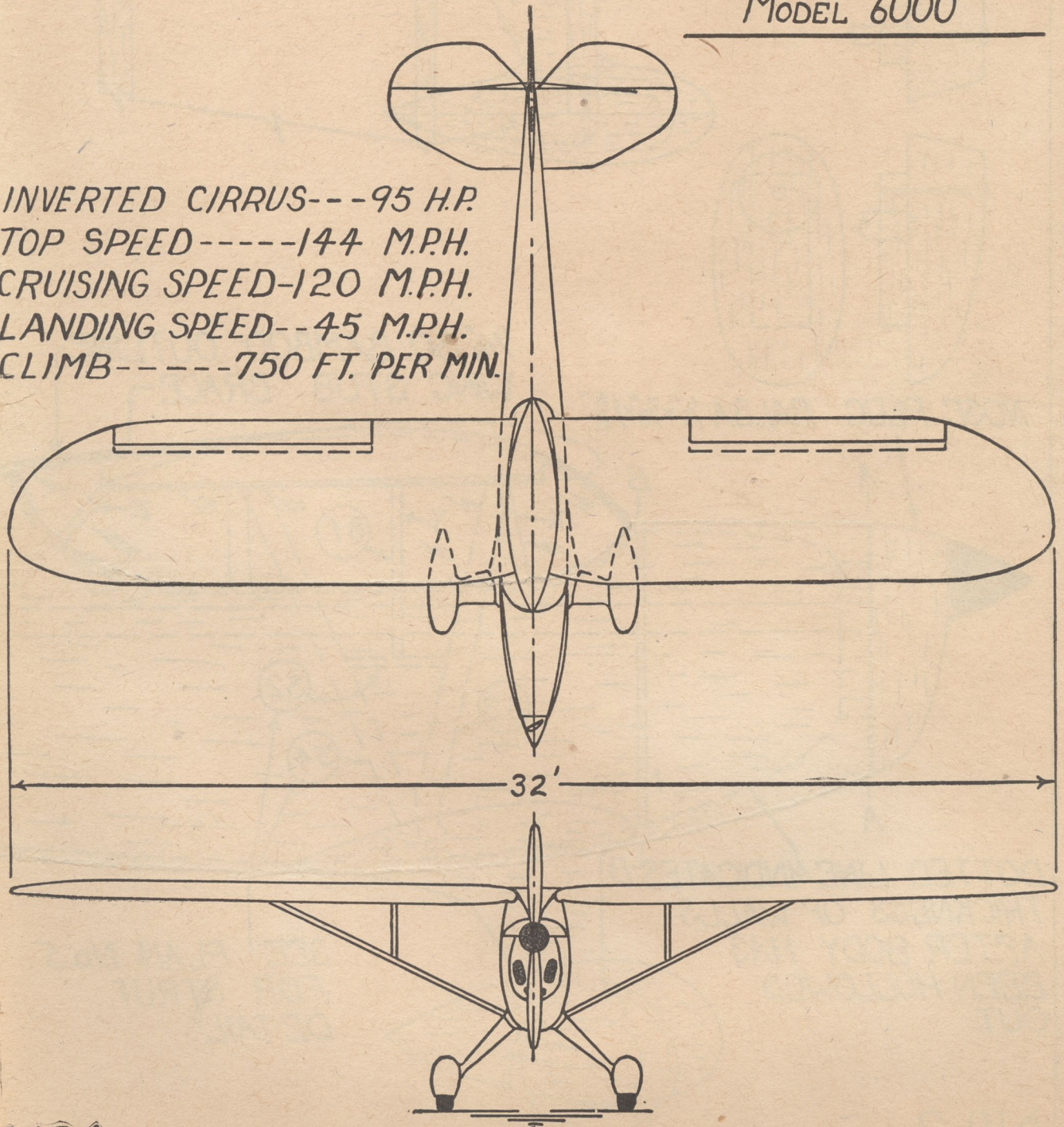
(Continued on page 55)

REARWIN SPEEDSTER—Plan 1



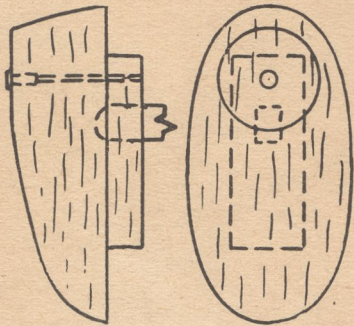
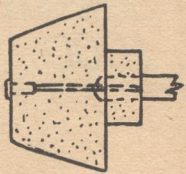
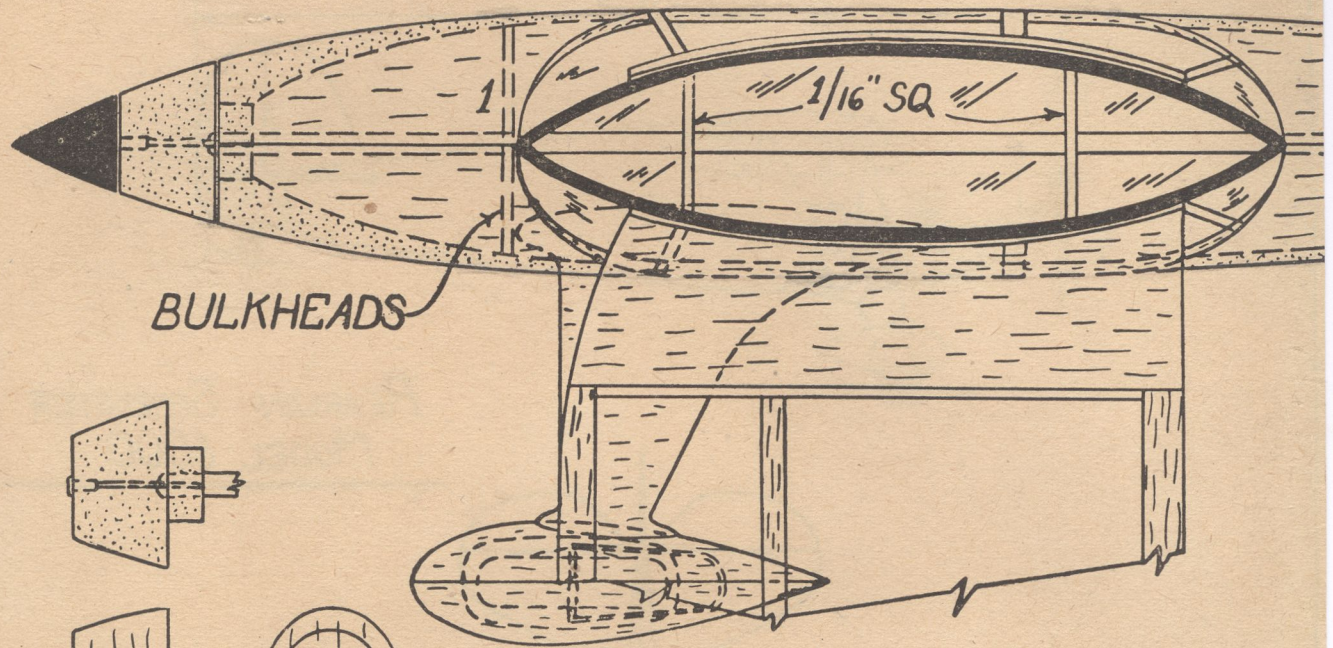
REARWIN SPEEDSTER
MODEL 6000

INVERTED CIRRUS---95 H.P.
TOP SPEED-----144 M.P.H.
CRUISING SPEED-120 M.P.H.
LANDING SPEED--45 M.P.H.
CLIMB-----750 FT. PER MIN.



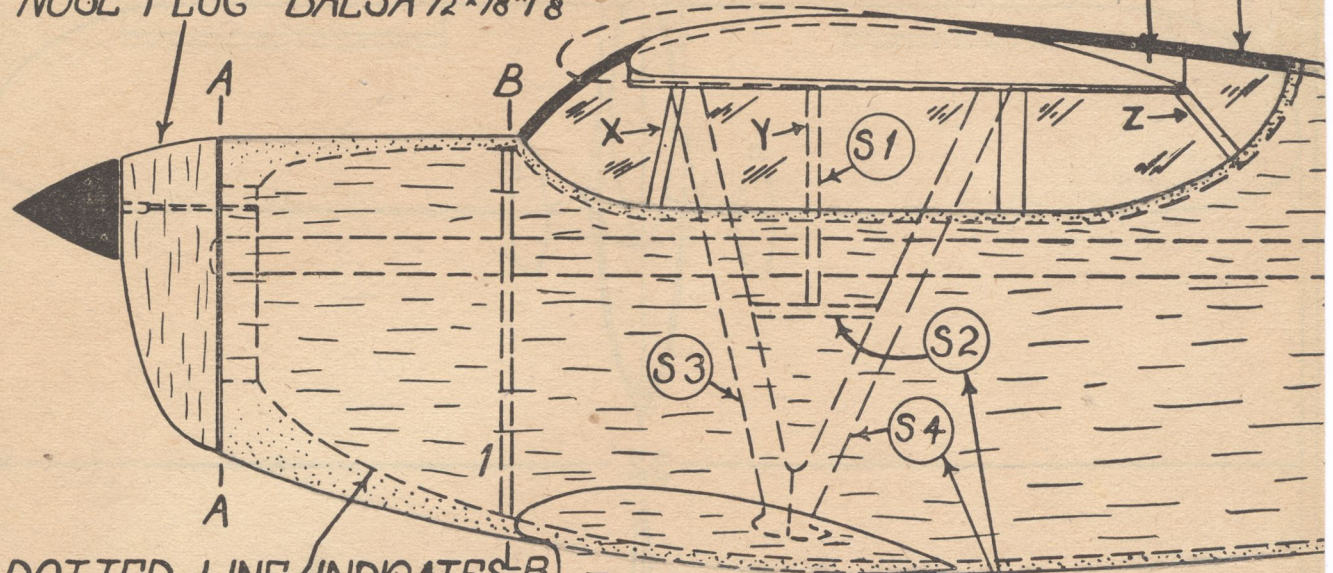
No 1

HARRY APPEL '35



NOSE PLUG Balsa 1/2" x 7/8" x 5/8"

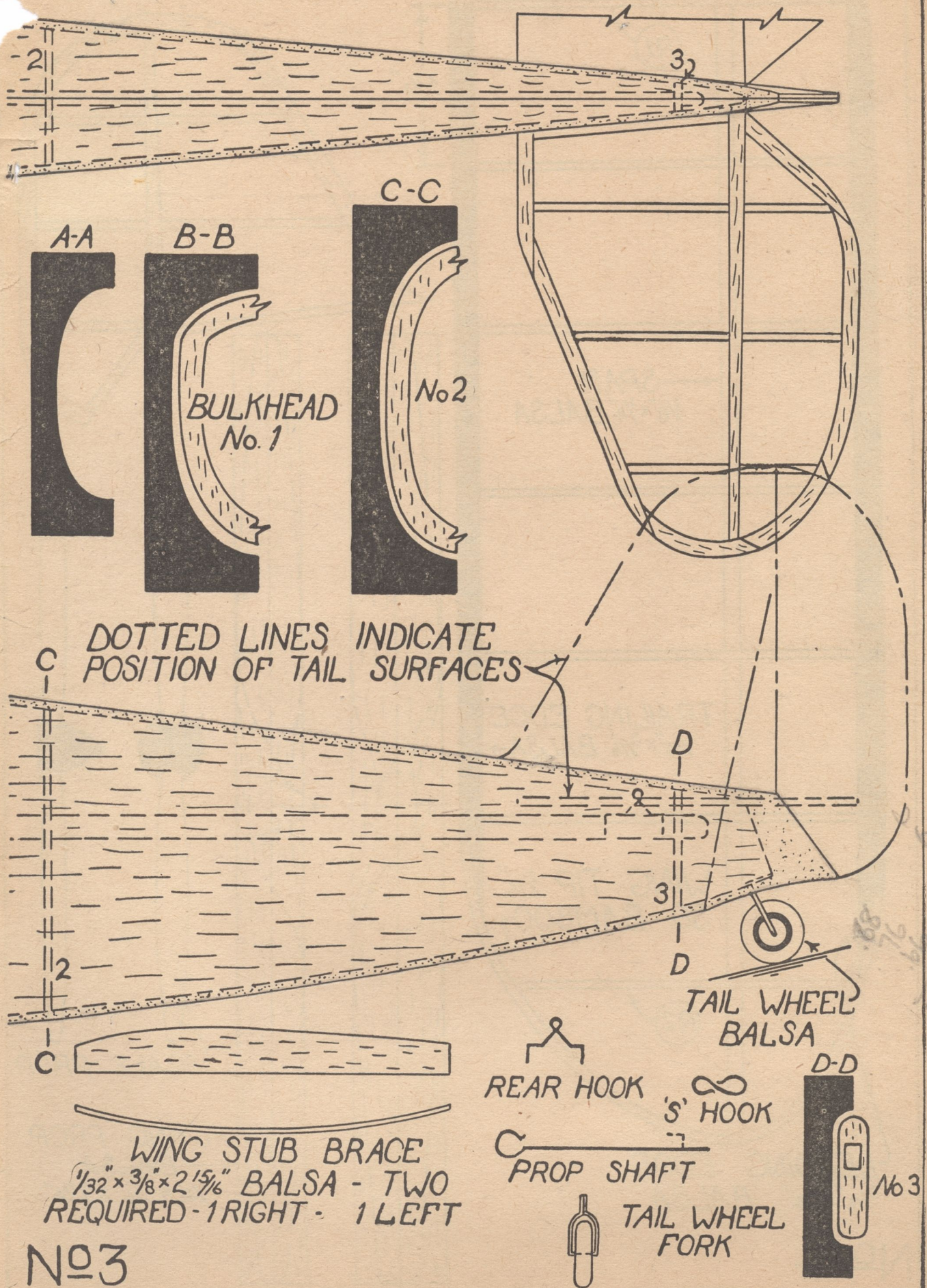
1/16" SQ. BAMBOO OUTLINE
WING STUB BRACE

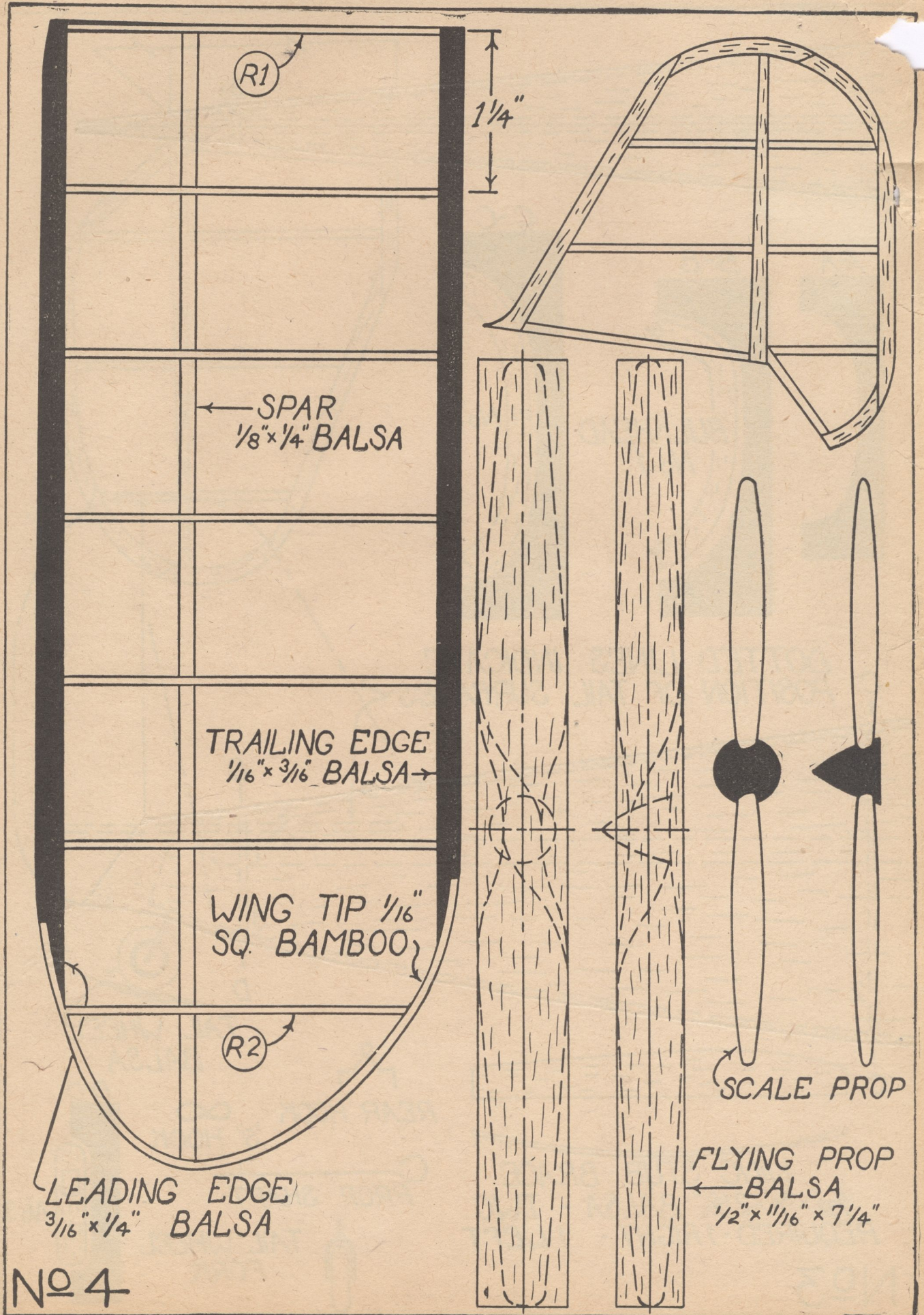


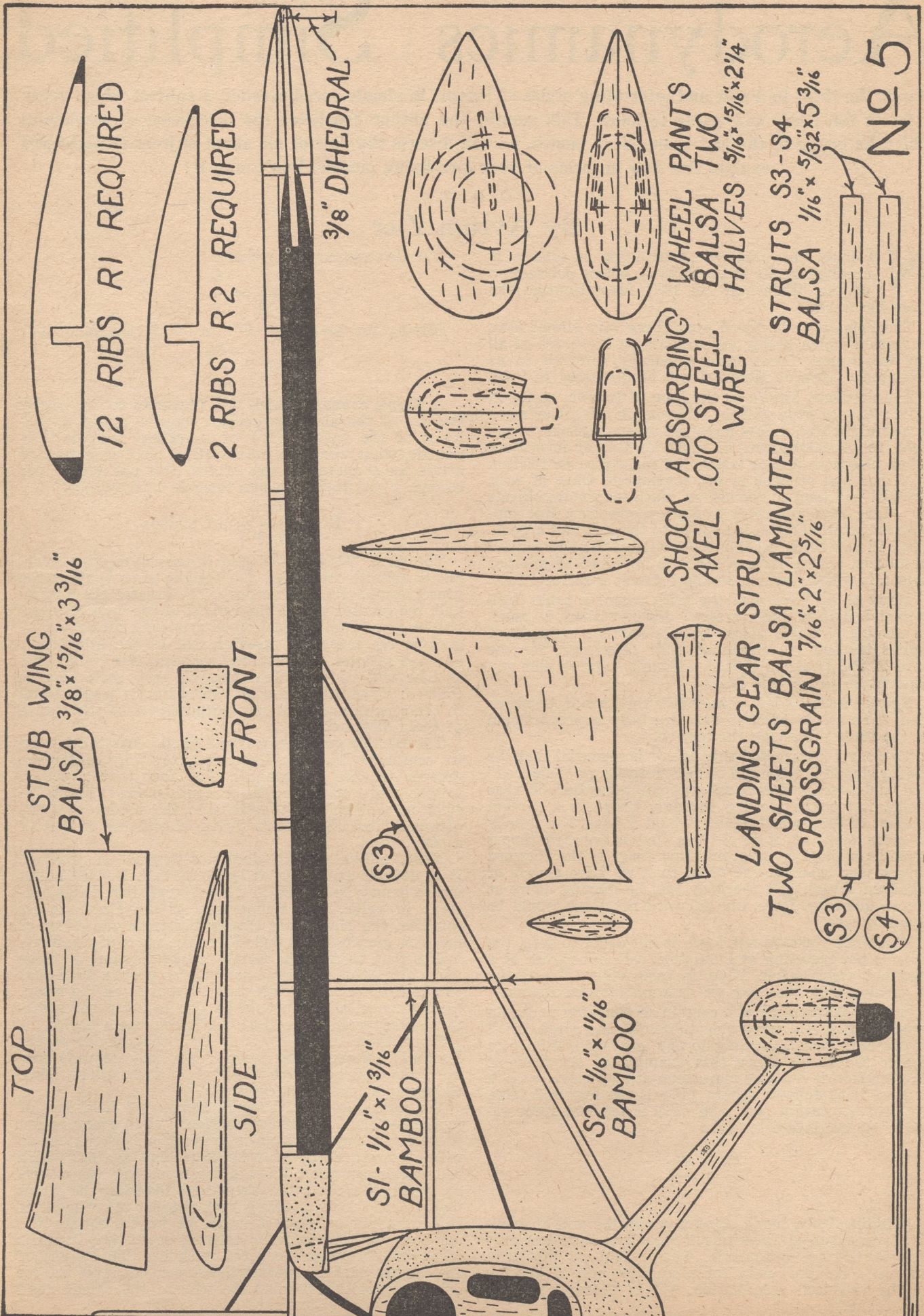
DOTTED LINE INDICATES B
THICKNESS OF WALLS
AFTER BODY HAS
BEEN HOLLOWED
OUT.

SEE PLAN No. 5
FOR STRUT
DETAIL.

No 2







Aerodynamics Simplified

Here's the third in a new and interesting series of lessons in simple aerodynamics, a subject which every aviation fan needs and wants to know. This month, the author concludes the discussion of mechanics which he began in the last issue. Next month, he will discuss the flow of air about objects in flight and explain this flow in terms of your own flying models. Don't miss it!

* * *

By Avrum Zier

NO doubt the greatest contribution to science is credited to Sir Isaac Newton, whose publication of the "Principia" in 1687 revolutionized the scientific world.

The Principia was based upon three very simple laws of motion which to-day still remain as the bases of all our mechanics. These laws, generally referred to as "Newton's Laws of Motion," will be discussed in turn.

The first law, known as the Law of Inertia, states in brief: "Every body will tend to remain at rest or move in a straight line, unless impaired by an external force." Relatively speaking, we can illustrate this by imagining a ball placed on a floor where the resistance or friction of either ball or floor is not considered. Once at rest, the ball will tend to remain so, since inanimate objects in nature have no power to move themselves. But suppose an external force is applied to the ball, say a push. The ball now being set in motion will continue to remain in motion. Unless its movement is impaired by another object, it will travel in a straight line at a uniform rate.

Many of us have seen the trick where a table cloth is snatched from under a set of dishes without so much as moving a single piece. This is another example of bodies tending to remain at rest. (However, for the sake of the family dishes, I wouldn't suggest that you attempt to prove this law.)

Newton's second law of motion is the Law of Acceleration. "The acceleration of a moving body is proportional to the force producing the motion."

To clearly understand this one, it is essential that the reader should first form a clear conception of "balanced" and "unbalanced" forces. Every body, regardless of what media it may be moving through, produces a certain amount of drag which tends to hold it back. For a body to move forward, it is obvious that a forward thrust must be applied to overcome this drag. If the forward thrust just balances the drag, then we have a case of balanced forces, and the body will be moving along at a constant rate. Here, our forward net force would be equal to zero.

When our forward net force is *not* equal to zero, the body is not traveling at a constant rate but rather at a constant acceleration. Thus, in cases where the thrust is greater than the drag we have unbalanced forces.

If a car is traveling at a certain acceleration under an applied force and we decide to double the acceleration of the car, then, according to our law, we will have to double the force. Since this example of the Law of Acceleration is nothing more than a proportion, we can express it as follows, where (F_1) is the required force for an acceleration (a_1), and (F_2) is the new force required to accelerate to (a_2):

$$\frac{F_1}{F_2} = \frac{a_1}{a_2}$$

A falling body, being acted upon by the pull of gravity, is an excellent substitution for a force and acceleration in the above formula. The weight of the body may be considered as a force, and the pull of gravity as the produced acceleration. (32.17 feet per second per second.)

Our formula now becomes:

$$\frac{F}{W} = \frac{a}{g}$$

Solving for the force (F) we obtain the following:

$$F = \frac{Wa}{g}$$

A simple example which will illustrate to the reader the use of the above expression may be stated as follows: If the weight (W) of a certain body is fifty pounds, what would be the required force necessary to attain an acceleration (a) of two feet per second per second. Substituting in our formula and solving:

$$F = \frac{50 \times 2}{32.17} = 3.1 \text{ pounds}$$

The term "weight," as used in the above expression, has a definite meaning. The weight of a body is the gravity pull acting on the body. The greater the gravity pull, the greater will be the weight of the body. Gravity pull or attraction depends upon mass and distance. The greater the mass, the greater will be the attraction; and the greater the distance between two bodies, the smaller will be the attraction. We may state this as follows: "The attraction of two bodies is proportional to their mass and inversely proportional to the square of their distance."

The Earth's gravitational pull is concentrated toward its center, so that the closer we are to its center the greater will be our weight. The fact that a person weighs more at the north or south poles than at the equator, will help to illustrate to the reader how the distance from the earth's center effects the weight of a body.

Mass, unlike weight, does not depend on position, it is defined as the *quantity* of matter. Regardless of where it may be located in the universe, it remains constant in value. The comparison of the Earth to its satellite, the Moon, will clearly illustrate the effect of mass on gravitational pull. Since the mass of the Moon is less than that of the Earth, it has only one sixth as much attraction, so that a body which weighs 60 pounds on the earth would weigh only 10 pounds on the moon. On the moon, a child would be able to bat a ball a distance that would make Babe Ruth look like a novice.

From these examples, it is clear that as far as the Earth is concerned, the weight of a body depends only upon the distance from the center of the earth, since the mass is considered constant.

We now come to Newton's third, and last, law of motion—"The Law of Interaction." "For every action there is an equal and opposite reaction." For a car to move forward there must be something against which the wheels can push. When a car is moving, the wheels are pushing against the street and, likewise, the street may be said to be pushing back against the wheels. If this were not so, then it would be impossible for the car to move forward. We have all seen what happens when the streets are covered with ice. The wheels of the car are pushing against the street, but since the ice offers no friction base to the wheels, the wheels tend

(Continued on page 79)

Build the Fairchild Amphibian

FAIRCHILD

10-PLACE

HIGH SPEED

AMPHIBIAN

ALL-METAL,
STRESSED SKIN
HULL CONSTRUCTION

WING AND
EMPENNAGE CLOTH-
COVERED STEEL
FRAMEWORK.

RETRACTABLE LANDING GEAR,
TAIL WHEEL AND WING FLOATS.

Powered By 650 H.P. PRATT & WHITNEY
HORNET

1.

2.

3.

BAGGAGE HATCH

PASSENGER HATCH

WING FLAP

AILERON

1.

2.

3.

A.

1.

2.

3.

A.

SUGGESTED FINISH

SHADED PORTION BLACK

REMAINDER SILVER.

SPAN 56'

LENGTH 46'

WEIGHT (EMPTY) 5500 LBS.

SPEED (3000') 184 M.P.H.

CEILING (ABSOLUTE) 20,000'

RANGE 750 MILES

LANDING LIGHT

PONTON SHEATH

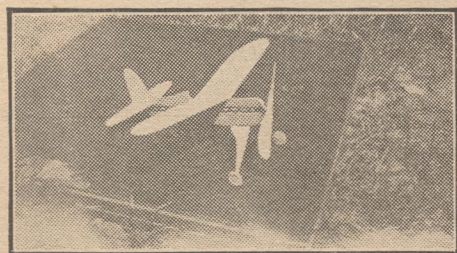
EXHAUST

0 4 2 3 4 6 7 8

6-9-35

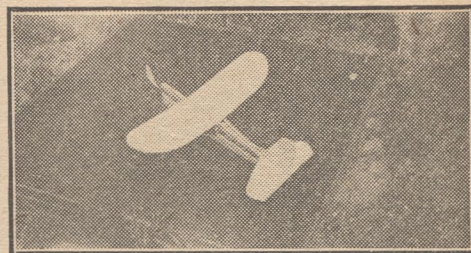
HAS-
OLTZ

Flying Aces "Sil-oo-et" Pursuit



Here's the completed model—ready to go! Note the zip that's been built into its lines. Looks like it might take off from that table-top airport right while we're looking at it. Contact!

Very fast flights are in store for you with this clean-cut model. And the simply-constructed silhouette fuselage, which is several revs ahead of the usual stick model, gives you a snappy job that looks like a real plane. Julius Unrath designed the "Sil-oo-et" Pursuit for beginners—but beginner or veteran, you'll find this smooth-flying craft among the aces on any man's airport.



This "shot" shows you the neat construction of the "Sil-oo-et" and gives you a good idea of the wing design and tail members. You can almost imagine it's a real ship down on the airport viewed as you're coming in for a landing.

★ ★ ★

By Julius Unrath

SINCE this model is designed to be built by the beginner, we have been careful to make the work of construction extremely simple. The "Sil-oo-et" type of model, presented herewith, does away with many of the difficult fuselage operations which so often "stump" the beginner. Due to the simplicity of our "Sil-oo-et" Pursuit, you should have no difficulty in producing a fine flying model. Go to it!

INSTRUCTIONS FOR BUILDING

THE first step in the construction of the model is to cut the fuselage outline from a piece of $\frac{1}{8}$ " flat, medium-hard balsa. Bend the thrust-bearing, can, and rear hook attachment from $\frac{1}{64}$ " sheet dural or hard brass. Cement these in position and cut the slot in the fuselage for the rubber motor. The tail surfaces and cabin are cut from $\frac{1}{16}$ " sheet balsa and cemented in place. The landing gear is bent from No. 10 piano wire and faired with hard $\frac{1}{16}$ " sheet balsa. A pair of 1"

pine wheels are used and a drop of cement on the end of the axle will keep them from coming off. A six inch balsa propeller may be purchased at any supply house at a reasonable rate and will save the builder much trouble. The wing is cut from $\frac{3}{32}$ " medium hard balsa and sanded to an airfoil shape.

The model is now ready for coloring. Before applying anything, give the complete model one coat of dope. When the dope is dry, sand the model lightly and apply one thin coat of a high grade of lacquer.

To fly the model, add two strands of $\frac{3}{16}$ " rubber and test with a glide. If your ship stalls, a small amount of lead should be added to the nose. If it dives, the lead should be cemented to the tail. Very fast and smooth flights will result if the model is constructed properly.

Please enclose stamp when asking for information, and address letter to me, personally, in care of FLYING ACES Magazine. Write in and let us know how your models turn out.

From the Model Builder's Workbench

NO GUESSWORK ALLOWED

THE first thing to remember in making a model that you want to fly well is to follow the plans accurately. Don't try to change them, and don't guess at dimensions, etc. Use a jig on the fuselage to get it just right. If the fuselage is warped out of shape, it will sometimes affect the line of thrust to such an extent that your model will not fly. Often changes in the plans will mean that some of the parts will not be strong enough, and the ship will not balance well.

Don't try to save money by using cheap balsa. Balsa wood is very delicate. It warps easily, and breaks easily. A good grade of balsa is absolutely necessary. A straight-grained, firm balsa will benefit your model, whereas a flimsy, soft kind will ruin it.

Warped parts are responsible for the failure of many flying models. A warped fuselage will change the angle of incidence of the wing with the line of thrust, causing the plane either to dive or stall. The propeller, too, should be made exactly as the plans call for, without warp. The blades should be sanded

enough so that the light from an electric light bulb can be seen through them. Be sure that the propeller balances perfectly. If you have trouble with your model landings, try making bamboo landing gears pointed on the ends so that they can stick into the longerons.

If you balance your plane with lead, you are shortening the life of your

model. The plane may balance all right with the motor wound, but when the motor is unwound, the plane falls heavily, often damaging vital parts.

ARTHUR SEGARD.

MONOCOQUE FUSELAGES

THE model builder who likes to make detail scale models has always been faced with a difficult problem when he has wanted to reproduce an all-metal airplane. The wood monocoque construction airplanes such as the Lockheed Vega have presented the same problem.

The difficulty in making an accurate model of this type lies in the construction of the fuselage. The wings may be built up in the usual manner and covered with very thin balsa. When given a good finish, they may be easily made to represent a metal or plywood-covered wing. But the fuselage is a different matter.

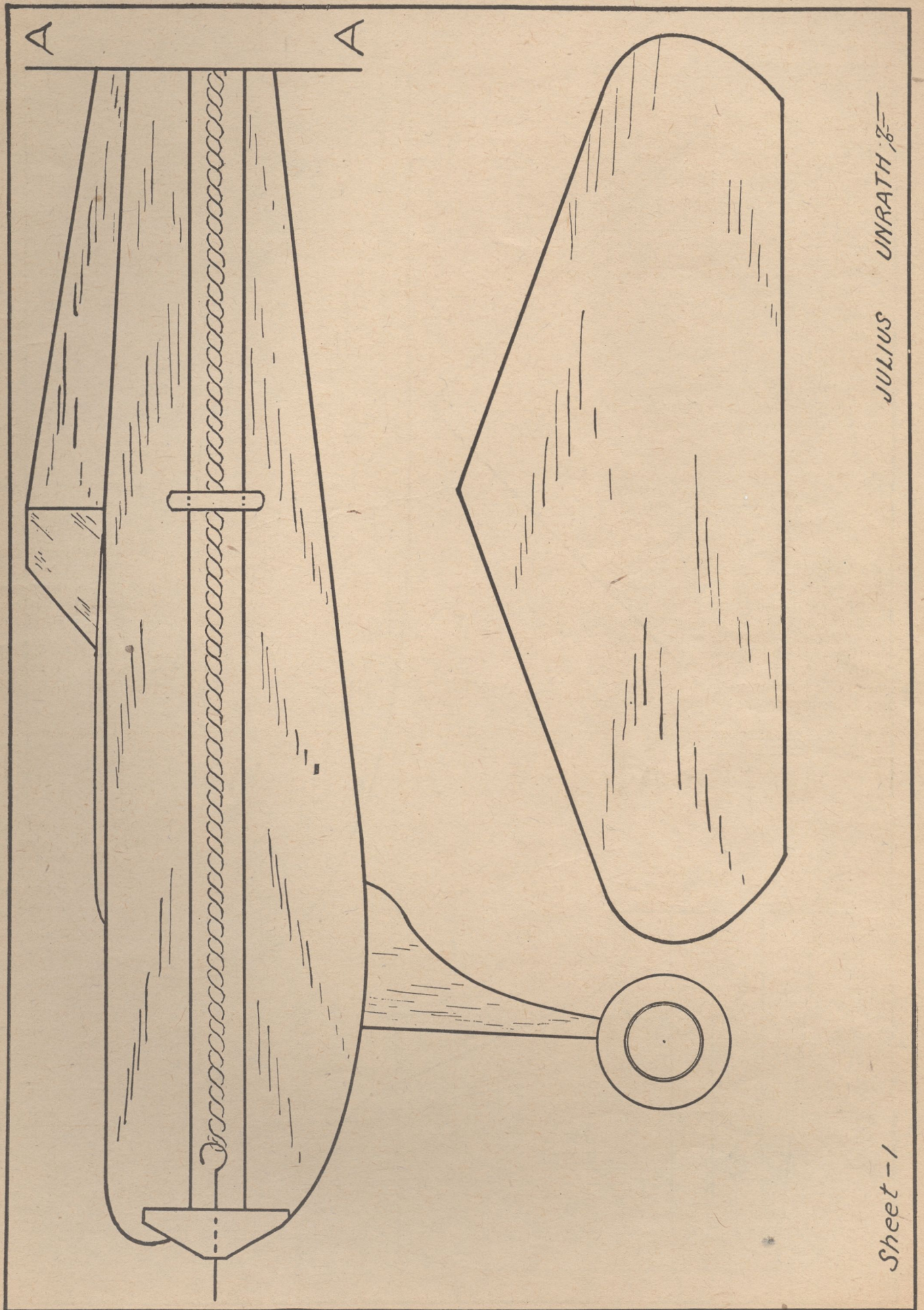
If it is built up and covered with paper, the stringers and bulkheads give an undesirable effect. Carving from solid wood leaves much to be desired

(Continued on page 43))

Attention, Model Builders!

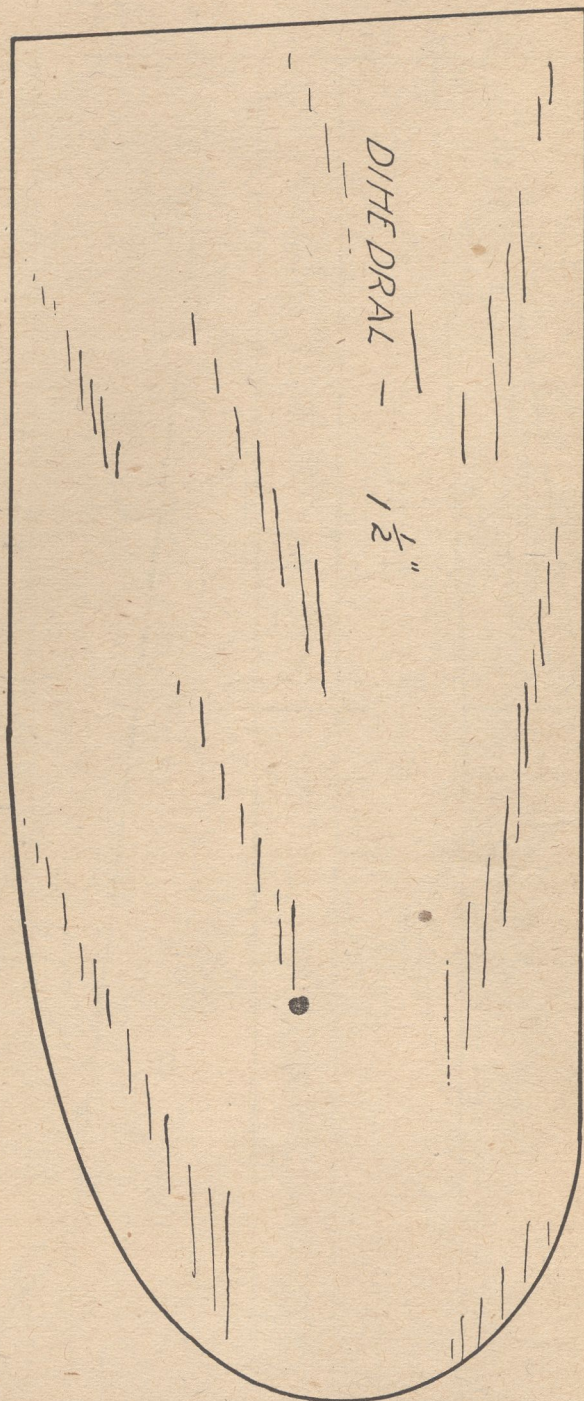
FLYING ACES wants plans and directions for building flying scale models of the latest modern planes. In order to be printed in this magazine, drawings must be done in India ink, and must fit a 7 x 10-inch page. Plans should not exceed six pages. Photographs of completed models must accompany plans. Send in your work, model builders, and get it printed!

●



Sheet - 1

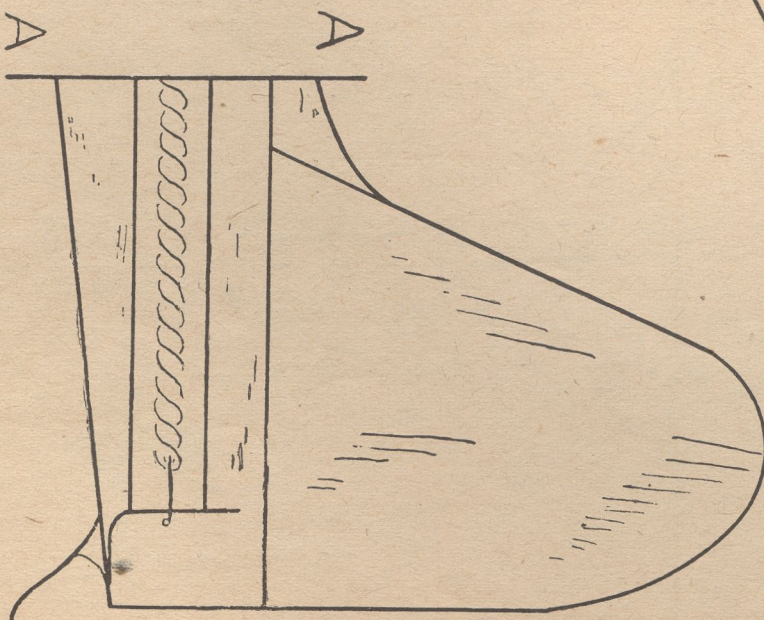
JULIUS UNRATH, 8-1



THRUST BEARING



REAR HOOK PLATE



Sheet - 2

JULIUS UNRATH 28-2

Flying Aces Club News

This month, Douglas Allen again takes over the controls of the FLYING ACES transport and (via imagination) takes you to a big convention in Atlantic City. We'll try to make it so realistic that you'll actually feel the salt spray from the ocean! Let's go!

WITH a whirr, our propellers take hold and our huge FLYING ACES ship noses into the air. We soon find ourselves flying high over the canyons of Manhattan, then we dip low over the Statue of Liberty and follow the white shore line of the Jersey Coast southward. It's not long before we sight our destination—Atlantic City, the playground of the world! In a few minutes (seconds, it seems) our plane is set down at the Atlantic City Airport and we are met by Mr. G. B. Jarrett, of the Jarrett World War Museum on the Steel Pier. Mr. Jarrett escorts us to our hotel on the boardwalk. Here, we find the swimming delightful—and we eat for all the world like bears!

Our convention is being held in the Jarrett Museum and next morning at the stroke of 9:00 we get under way. Arch Whitehouse, Douglas Allen, and "Aces Up" all give short addresses on the value and progress of aviation.

Rap-rap-rap! Chairmen Douglas Allen is calling for order.

John Selepah, of Wilkes-Barre, Penna., is first given the floor. We thought we heard one of those hand "crickets." Sure enough, the shades are drawn and before we know what is really up we are shown some beautiful pictures of some of John's models. And boy—can he build! We are particularly impressed with his models of a Seversky Amphibian, a Vought V-65, a Sikorsky and a Graf Zeppelin, all built from kits secured from FLYING ACES advertisers. A loud round of applause!

Who is that standing up now? Why, it's Bill Dant, of Louisville, Ky! Bill tells us that he came all the way from his Southern city to tell the delegates to the convention that whatever he amounts to in the aeronautic field has been directly due to FLYING ACES and the F.A.C. In part, Bill says (in a slight Southern accent): "It was your magazine and your club that caused me to become so interested in flying and airplanes, and I think it only fair that I should tell you this."

All eyes suddenly turn in the direction of a member who has asked for the floor. "Looks like Admiral Byrd," we hear someone whisper. Well, it's none other than Bill Tymeson, one of the charter members of the F.A.C.! Yep, it's the District Commander of the 13th Squadron, F.A.C., N. Y.! And hear ye, members, Bill holds the distinction of having organized the first naval squadron in the entire F.A.C. In fact, we know of no others and if any exist we'd like them to report to GHQ with full information.

Melvin J. Kaplan, 300 Riverside Drive, New York City, next addresses a plea to all members of the F.A.C. Mel, in part says: "We are forming a subsidiary of the F.A.C., known as the 'Society for the Advancement of American Military Aviation.' We would like all members of the F.A.C. who are directly interested to write us. We feel that much can be accomplished, even through the medium of correspondence."

And here's a fellow who came a long, long ways to attend our convention! We refer to J. T. Bentley, Jr., of Salisbury, South Rhodesia, South Africa. When "J.T." arises we're in for a high revving, interesting half hour. At this point, "Doug" signals our official stenographer to be sure to take down the entire address. It is well he did, for we could never in a million years portray "J.T.'s" experiences in the colorful way he has of forming mental pictures. To use his own words:

"In the first place, I have moved and now live at a point 250 miles from Salisbury, the 'Kariba Gorge' on the Zambezi River. Here we can take a half dozen steps out on the boardwalk and mail a letter, but it takes my runner-boy three weeks to reach the post office, and often longer in the event of flooded rivers."

Pointing to his pilot wings, standing

out conspicuously on his white lapel, our friend continues:

"I'm willing to bet a two ton elephant tusk to one of your Atlantic City oyster shells that any member of the F.A.C. here, including your National Adjutant, does not regard his WINGS as highly as my brave hunting boys!"

At this point "Doug" Allen arises with an "I object!"

"Now wait a minute, Doug," continues "J.T." "At home I wear my WINGS on my helmet and my men sleep near my hut all night believing the F.A.C. badge on my helmet will protect them from evil spirits."

Turning to "Doug" again, J. T. continues: "Just before I left I received a letter from you. It had five cents worth of postage on it—a 3c stamp and a 2c stamp, bearing the profiles of Washington. Twenty four hours after I received the letter, the stamps disappeared. I questioned my boys. No, they knew nothing about it—Oh, no! I subsequently found that one of my boys, 'Chankwa,' headman of his tribe, had eaten the two stamps, believing that the profiles of Washington would enter into his body, and thus give him the strength of two additional men."

Our South African friend then continued to tell us how he and his boys had built an air field in the heart of that wilderness and how he was struck with awe at the sight of the first plane to land on his tarmac—a British Gypsy Moth, en route to London. And last, but not least, he cautioned us to be on the lookout for cannibals should we visit South Africa. He goes on:

"Many people in America, and other countries, declare there are no such things as cannibals in Africa. Aren't there? Just let them come with me and see! Cannibals live 7 miles from us and we only found that out a short while ago when the head of my most trusted servant, 'Jim,' was found stuck on a stick a short distance from our camp."

At this point, the drone of a plane motor is heard overhead adding to the din of applause. Some of us near the windows get a good side view as it turns towards the airport. In large white letters we make out "F.A.C. ALLEGHENY DIVISION." At once we recognize one of the club's oldest friends—Colonel W. B. Thorne, Commander of the Pittsburgh area.

Having bucked head winds all the way, Colonel Thorne asks to be excused from speech-making, declaring that after the address he just listened to on his radio (referring to Bentley's talk) anything he might say would be too tame.

As Colonel Thorne is being led off to a shower and a good chicken dinner, someone in the auditorium calls out: "I have a complaint to register!" Given the floor, we recognize Ed Baggs from way down in Augusta, Ga. Says Ed:

"Back in January, I sent you a letter accepting honorary membership in the club, written by a mighty well-known man. That man was John Nance Garner, Vice President of the United States! For some reason I never got credit for this and demand an explanation."

"Doug" Allen, turning as red as a boiled lobster, assures Ed that the matter will be carefully checked upon his return to New York. And no sooner had "Doug" seated himself, but someone 'way up front starts waving a picture in the air. Say, it's Donald Jodin, of Lowell, Mass., and he has a picture of Ginger Rogers! Let's read the inscription. Here it is: "To the FLYING ACES CLUB: I am highly honored that you have chosen me as an honorary member."

Business over, we leave the auditorium fully intent upon filling our lungs with Atlantic City's exhilarating salt air, for tomorrow we'll board our transport and be off to our respective homes.

—DOUGLAS ALLEN

All Questions Answered

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

Bill Todd:—The Helldiver is a two-seater. The aspect ratio of a wing is the ratio of the chord to the span. If you take an airfoil of a tapered shape, you have to allow for the change in the surface, all of which is too complicated an explanation to offer here. The shrouds of the average parachute are about eighteen feet. I do not have the exact measurements in any of the parachute catalogues I have on hand. I'm afraid anything shorter than this is not practical for a parachute of any size to take the weight of the average man.

Woodrow Snyder, Princeton:—The U. S. Department of Commerce, as far as I know, had no more to do with keeping Fitzmaurice's ship out of the Australian race than did the British or the Australian authorities. It simply did not pass regulations, and even after it was changed, it started to fall apart in the air when Fitzmaurice tried to beat Scott's record, so that he had to return to England. So all who had anything to do with keeping Fitzmaurice out of the race were actually doing him a good turn. He finally got an Irish Free State O. K., I believe.

Ray Kreft, Brockton:—I advise you to write to the National Glider Association, Dime Bank Building, Detroit, for the information you desire on gliding and gliders. I can't give it all. The art of listening to and telling one motor from another is hard to describe. You can only get it by being near these various engines all the time. Why not write to the firms making the racing planes you are interested in, for pictures and descriptions of them?

Sam Scaffer, Philadelphia:—Untractable wheels may be covered with pants to reduce air resistance. Linen fabric and sheet dural are the two chief materials used for covering ships.

Claude Panz, Manasquan:—There is no record of the number of types of ships Fokker put out during the war. It was probably about twenty. The same Douglas air liner as flown by the Dutch in the Australia race crashed in Asia, yes. Glad you like our two air magazines.

Jack Rice, Denver:—Your letter and questions are not clear. There is no question but that von Richthofen's triplane was crashed badly. I do not know anything about the picture you refer to in another magazine, but if they are showing an intact ship as the one in

which von Richthofen was shot down, some one is kidding the public. When the ship was at Bertangles, it boasted only the fuselage, as far as I can remember.

David Shapiro, South Africa:—I do not have any record of the last German to be shot down during the war. Perhaps our readers may have a story on this.

Dinny Waterman, Davenport:—The Boeing you refer to was a 1930 Boeing F-12b. The Boeing P-12e shown in the December issue is correct. The headrest did not come in until later models. The Lockheed Electra has one rudder.

Byron Dott, Milwaukee:—Lufbery was a member of the 102nd bombing squadron and then of the Lafayette Escadrille, Nieuport Squadron 124. Later he transferred to the American Air Service and was made a major, in the 94th Squadron. He had no particular

insignia, except the Indian head of the Lafayette.

Charles McBee, Fort Worth:—The question you brought up concerning the rocket ship on our December cover, would be hard to answer, as no such ships have been made as yet. However, I do not believe that the all-metal ship, flying at the speed it is supposed to go, would even be warm from the rocket exhausts.

Russell Miers, Newcastle, Indiana:—I would prefer that you wrote to the War Department for the information on your brother. I can find no record of the 486th Squadron in France. Voss was killed Sept. 23rd, 1917. Karl Schaefer was killed June 5th, 1917.

Robert Kernohan, Philadelphia:—The hedgehopper you refer to, I'm afraid, is some sort of a trick training ship, but as there are several models in as many air forces (or were) I can't give you

any details on their so-called performance.

Jack Amram, Lakewood, Ohio:—The top wing of the Fokker triplane was no weaker than those of most war-time ships, as far as I know; but a lot of them did pull off after the Armistice when Allied pilots were flying them back as captured ships under the treaty.

Jimmy Wommack, Wilmington:—I can't give you any advice concerning any eye ailment. You had better see a Department of Commerce physician. You must pass a physical examination for any type of license. The ceiling of a ship is the actual height to which it can fly with its full load. There is no age limit on parachute jumpers as far as I know. Thanks for the good wishes.

Herbert Zettler, Bronx:—Anhedral is the opposite of dihedral. The artist you refer to had no war experience, as far

Airmail Pals

Your letters, F.A.C.'s, have been pilin' in here like a barrage on the Western Front, so this month we're printing half again as many names—we're going to keep at it until we catch up! If your name hasn't appeared yet, don't think we've cracked up on you—it'll be along. We're sorry we haven't space to print entire letters, but the right-hand column will give you an idea of the writer's interests.

Name	Address	Description
JACK MADDOX	831 N. Eucalyptus, Englewood, Cal.	Has interesting souvenirs. Dad once owned Air Line.
HAROLD SALCHOW	3909A—N. 10th St., Milwaukee, Wis.	Will trade air books.
W. MATCHETT	4 Bissell St., S. Manchester, Conn.	18. Wants foreign pals.
ARTHUR W. RETZEL	213 Highwood Ave., Weehawken, N. J.	Radio his hobby.
CHARLES WHITESIDE	22 Mack Ave., Shelby, O.	17. Belongs to many air clubs.
OPAL J. SEVERSON	Ambrose, North Dakota.	18. Air mag. collector.
WM. GRIFFITHS	c/o Imperial Oil Co., 56 Church St., Tor., Ont.	17. Blue-eyed blond. 'Nuff said.
AARON D. YADLOVSKER	1169 Wheeler Ave., Bronx, N. Y.	S.O.S. to stamp collectors.
LOUIS WOZNIAH	404 First St., Albany, N. Y.	17. Taking Aeronautical Eng. Expects to become pilot.
RAY KREFT	473 N. Warren Ave., Brockton, Mass.	Pen pals from all over welcome—if air-minded.
EDWARD MILLER, JR.	602—16 St. N.W., Roanoke, Va.	Wants correspondence from Scotland.
GENE SHAFFER	5821 Lawton Ave., Oakland, Cal.	Future naval officers, please write.
STEVE WASNEWSKI	156 Grand St., Brooklyn, N. Y.	Will trade airplane fabric.
HENRY REIBLE, JR.	42—20th Ave., Paterson, N. J.	Future U. S. Marine.
MARK TERREL	1,000 N. Kenilworth, Glendale, Cal.	Likes them young—13 to 16.
JAMES MILLER	317 W. Delaware St., Dwight, Ill.	Interested in homing pigeons, Army flying and models.
JOHN WRIGHT	105 Halyday St., Oil City, Pa.	Either sex welcome. Will exchange snapshots.
LAWRENCE BERNSTEIN	1225 Findlay Ave., Bronx, N. Y.	Ladies especially welcome. He's 18, blue-eyed, 5 ft. 9 inches.
FLOYD VAN DE VORT	222 W. La Veta St., Orange, Cal.	Photography, models his hobbies. First comer gets plans.
CLIFFORD HARRY, JR.	R.F.D. No. 4, Mt. Pleasant, Mich.	Rooter for the F.A.C. Club members please write.
ARTHUR BONTE	3024 Kingsbridge Ave., New York City.	Radio fan. Will give air books to first who write him.
T. A. HALL	Graemsdyke, Belvoir Dr., Aylestone, Leicester, Eng.	13. Says he's just aching for pen pals. Who'll cure it?
PAULINE KIRKBRIDE	Box 104, Route 3, Larned, Kan.	British F.A.C. wants American correspondent.
LEONARD RUNTON	4652 N.S. Yoenham St., Logan, Philadelphia, Pa.	17. Likes to write, and will exchange photos.
STANLEY DOWGIALA	314—7th St., Jersey Cy., New Jersey.	Likes plenty of speed.
HELEN GREENE	Box 304, Oak Grove, Ore.	18. Has medals for sharpshooting and lifesaving.
PAUL STEYER	119 Bradner St., Fostoria, Ohio.	Anyone who knew Capt. Collins of Laf. Esc., please write.
JIMMY MADDOX	308 E. 2nd St., Rome, Ga.	Wants to form squadron in his town. Rally 'round!
CHARLES MUNROE	69 Gordon Ave., City of Verdon, Quebec.	Southern F.A.C. wants to hear from other F.A.C.'s.
ROY REDMON	8030 Yale Ave., Chicago, Ill.	18. Six ft. tall. Wants fair sex to give him a tumble.
		16. Air-minded, and likes pen pals of all ages.

as I know. The Snipe had two sets of interplane struts.

Leonard Klein, New York City:—Great Britain has about six aircraft carriers. Japan has four, and several more are being built. France has one.

John R. Baxter, New Bern, N. C.:—The book you wish is published by the Appleton-Century Company of New York City. This address will reach them. The book costs \$2.50.

Bob Ahern, Buffalo, New York:—You take the biscuit. What guns were used on the Bristol Fighter, eh? Well, for the 7,987th time—front gun (one) Vickers; rear guns (two) Lewis. Top speed about 125; ceiling 23,000 feet. The German A.E.G. bomber was not used extensively throughout the war—not until about 1917 to the end. The war began in 1914.

Jack Owens, Calhoun, Ky.:—Your sketch for an idea on Mad Anthony Mainbearing is very good, and I'll try to work it up. I think, however, you are crazier than I. We must eat the same breakfast food.

D. Morton, Kansas City:—I do not know for certain what the speed of the new Northrop is. At any rate, it cannot be listed until it has been accepted and brought into an actual squadron.

William Balough, Detroit, Mich.:—I think you read my article on von Richt-hofen wrong. I did not say that Brown did not shoot the German down. I only quoted several other writers and persons who had something to do with it. I have collected some more, too, and would like to see the documents you have. They will be taken care of, of course, and returned to you safely.

Brud Fitzgerald, Philadelphia:—The Douglas swept-back wing goes back much further than the Albatross days. The R.E.P. monoplane had it in 1911. The 1908 Antoinette had it, and the 1911 Antionette monoplane had a fully enclosed undercarriage, too. The Weiss machine of 1910 had swept-back wings. The Handley Page monoplane of 1912 had swept-back wings. There were many more, too. The streamlined propeller idea is being revived again, but I do not see the real explanation of it. I cannot give out the addresses of well known pilots.

Bob Brott, Seattle:—The Beechcraft plant is the Beech Aircraft Company of Wichita, Kansas. There is no real defense as yet against punctured radiators. The Graf Zeppelin is still in service.

Floyd W. Van De Vort, Orange, California:—The Knight "Twister" is known to me, and it appears to be the only ship of its type in this country, as far as I know. However, there are several small planes of that kind abroad. You should take a special examination to learn the seriousness of your crash.

G. Sudall, Chadderton, England:—Many thanks for the clipping on Capt. Cobby. I get that magazine here, so I saw it, too; but we all appreciate the kindness. I will see that the young relative of Captain Cobby gets it. We also had a long article on Capt. Cobby in our SKY BIRDS magazine a short time ago. You must look that up.

Bruce Herrick, Auckland, New Zealand:—Thanks for the news on Grid Caldwell. Several other New Zealanders have written to me about it, too.

Rudy Nenzel, Reno:—The British Tarrant "Tabor" bomber had pants over the wheels late in 1918. There may be others, but I have no record at hand. I know of no aces listed as Latvians.

Donald Shoobridge, Long Beach, Canada:—Thanks for your long letter on the von Richt-hofen controversy. I will add it to the rest for an article later on. But I can't use the May stuff. It's copyrighted.

Bill Patterson, Toronto:—I do not have room to give all the ship types of those countries here. You should go to the Toronto Library and get out the latest editions of "All the World's Aircraft" and select what you want yourself. Captain Bert Hall, I understand, is still in prison somewhere in California. I cannot be certain of this, however.

F. Shepherd, London, England:—Thanks for the information on Beauchamp-Proctor. We learned of his death shortly after that article appeared. I was with No. 22 from early 1917 until the spring of 1918, and then went to a Camel squadron on the East Coast. I have no relatives in the R.A.F. now.

Walter Graham, Deerfield:—The only Hays I have record of is 1st Lieut. Frank K. Hays, of No. 13 squadron, who is credited with six official victories.

Eugene Liberatore, Waterbury, Conn.:—Many thanks for the colored pictures. No. 1 is the Parseval non-rigid balloon, which was developed long before the war in Germany. It was the training ship of many lighter-than-air pilots in Germany. I do not know No. 2, the Nossot. The Harlan was an early German mid-wing monoplane with a rotary motor. The Wright picture shows Wilbur Wright in the pilot's seat. That was the early biplane. The Farman is the early Farman longhorn biplane used as a trainer in the early days of the war. Latham's model, No. 6, was a Wright-type made long before the war. Thanks for the pictures. I shall be glad to add them to my collection.

Luis A. Moreno, New York City:—The list of aces you are interested in appeared in the April issue of our SKY BIRDS magazine. As you read both, no doubt your questions have been answered.

By ARCH WHITEHOUSE

Model Builder's Workbench

(Continued from page 36)

where interior details are concerned. Built up construction covered with thin balsa is difficult especially in ships that have many curves or large wing roots, as found on the Northrop Gamma. And of course the use of metal is out of the question for all but experts.

In attempting to solve this problem of fuselage construction, I have developed a method which is not only easier than any of those mentioned but also gives better results. The method is as follows:

Carve from solid balsa or hardwood a perfect reproduction of the fuselage of the ship, including wing roots, fin, and fillets for the stabilizer. All filleting may be done with plastic wood or putty, and the general finish need not be perfect. The important thing to remember is that all dimensions and sizes must be 1/16" undersize. Give this rough model several coats of shellac or other wood filler, then sand it and wax it. The waxing is important.

Now take a sheet of tissue and soak it in water. Place it on the fuselage form and press it tightly to the surface in all places. The paper will naturally be crumpled and creased all over, but being wet it will follow the form of the fuselage. You may apply it in strips if you wish. Wrinkles do not matter. Allow this paper to become almost dry on the form and then give it a coat of shellac or nitrate dope. The dope is preferable because it dries faster. When this coating has dried, apply more paper. Common newspaper works very well when wet down and applied in strips. Again allow the paper to almost dry and apply two more coats of dope. Continue to apply alternate coatings of paper and dope until you have reached the approximate thickness of 1/16". The last coating of paper must be carefully applied with a minimum of wrinkles. Give several coats of plain dope to finish, and then sand it well. Apply colored dope finally.

When you have completed this process and everything is dry, take a razor blade and carefully cut out windows or cockpits, as required, in the paper covering. Then split it along the top and bottom directly on the center line. If the form has been properly waxed, the two halves may be lifted right off. Cement the two halves together again and you have a perfect monocoque fuselage with no internal construction to hamper inside detailing, and no visible seams outside.

When once you have made the wooden form, you can mold any number of fuselages on it. This process takes a considerable length of time because of the necessity of waiting for dope to dry, but work can be carried on with other parts of the model to fill in the time during the process. After a little practice, you will be able to turn out models whose fillets and curves blend together to perfection.

JOHN MACKENZIE.

Weird Wireless

(Continued from page 3)

The Boche pitched back, slid down onto his gun. Still spouting, the Parabelum tilted into the sky. The seaplane whipped violently to one side. From the nacelle beneath the fuselage, twin-guns erupted frenziedly. Tracers scorched within six inches of Strange's head. He felt the impact of bullets on metal, then his left-hand gun went dead.

He jerked the stick to his chest. The Spad screeched up in a zoom. He was twisting around for a burst at the seaplane pilot when for the second time bullets from unseen guns flamed from out of the mist. He banked sharply, clamped the trips together. The right-hand Vickers replied with a chattering roar. The scarlet lines ceased to stab from the gloom, but almost at once another torrent of tracers rained down from the darkness above.

Stuffing flew from the crash-pad at Strange's back. The compass went to pieces under a blast of lead. Strange hurled the Spad around and plunged beneath the seaplane. The fire from the other ship instantly ceased. He had a flashing mental picture of the pilot racing to trap him as he zoomed. A grim smile flattened his lips. The Spad reversed on screaming wings.

SUDDENLY, from up in the clouds, there sounded a dull explosion. A blue-green light spread through the mists. It changed to an angry red, then a fiery mass plunged into sight. The seaplane banked hastily and disappeared. As the falling inferno roared down near the Spad, Strange whirled in the other direction. The outlines of another ship vaguely showed in the murk. Two red eyes winked from the shadowy cowl.

The Hispano skipped a beat, broke into a ragged song. As the Spad slued off, Strange flung a last savage burst between the winking guns. The red eyes abruptly went dark.

The Spad lost altitude quickly. Strange searched the region below. He was over the heart of East End. By the holocaust which flamed beneath, he could see the tangled streets. Fire engines were rushing from three directions. People were milling wildly near the scene of disaster. He banked toward the Thames. With his engine crippled, the river offered the only landing-place.

He was down to four hundred feet when a howl of wings sounded above him. He stared back over his shoulder. A "Baby" Supermarine seaplane dived past him at furious speed. The backwash of the British ship threw the Spad to one side. As Strange brought it back to a glide, the Supermarine leveled out. The pilot seemed hardly to know that Strange existed. He was gazing down, and on his ashen face Strange saw a look of anguish.

For a moment, the seaplane hovered above the burning ruins. Then with a shriek it pitched on down toward the

river. Strange followed, holding the Spad to bare flying speed. He was almost in range of his goal when the Hiss sputtered and died. He saw at once he could never make the Thames. He banked, pointed the Spad back toward the flame-lit streets. Soldiers and bobbies were herding back the crowds, clearing the way for the engines.

Deliberately, Strange picked out a spot for the crack-up. At two hundred feet he tossed his goggles away. The left wing dropped in a forward slip. The surging crowd fell back as the ship moaned down to the street. Strange shifted the rudder bar, braced himself, and waited.

Wings swaying, the Spad pancaked down between two rows of buildings. A fire-engine thundered hastily to one side. The Spad's wheels hit with a thud. The plane careened under sharply applied rudder. With a crash, the right wing hooked a lamp-post. The Spad whirled around to a grinding stop. Strange jumped from the crumpled ship. An excited bobby ran to his side. He shook his head at the man's hasty question.

"No, I'm all right. But you'd better guard the wreck to see no sparks set it off."

The policeman's reply was drowned by the roar of another fire-engine. The machine halted, and firemen began to run their hose-lines down the narrow street. An official British car had stopped behind the engine. An officer with three gold stripes on his sleeve jumped out and started toward the burning buildings. As the glare lit his haggard face, Strange recognized Commander Dreyton, with whom he had once worked on an Intelligence case in London. Dreyton saw the wrecked ship and jerked around.

"Strange! How the devil did you get mixed into this?"

"Mixed is right," Strange said ruefully. "I came over here—"

Dreyton seized his arm and drew him out of the bobby's hearing. "You were up there?" he said tensely. "How in God's name did they wreck those buildings?"

"I don't know," Strange answered grimly. He described what he had seen. Dreyton's haggard face turned still whiter.

"It must be a death ray!" he whispered. "And if they can do that with one machine—" he broke off, glared at the G-2 ace. "If your office knew about this, why in Hades didn't they tell us?"

"We didn't know a thing. I'm on leave. I was trying to find Croydon when I ran into the scrap."

Dreyton's savage look abated. "Forgive me," he muttered. "I'm half out of my mind with this damned thing."

Strange's green eyes were fixed in space. "How long have you known this was coming?" he asked absently.

Dreyton jumped.

"How did you guess—"

"I saw one of your Thames patrol

seaplanes. Only an emergency would send them up in weather like this."

"You're right," Dreyton said huskily. "We were warned, though by means I can't explain." A fierce light came into his bloodshot eyes. "Strange, we knew the exact hour this thing would strike! We knew it would come from the air, and that it would be something more than an ordinary raid. We took every possible precaution." He spread his hands helplessly.

Strange's eyes narrowed. "This warning did not mention the place to be destroyed?"

"No, they must not have cared what they hit, just so they started a panic. But the incredible part is this: Not a single sound-ranger picked up that plane—even five minutes before it struck."

Strange glanced thoughtfully toward the conflagration.

"Can you think of any reason why the Boche should want those buildings destroyed?"

"Not the slightest. Why, do you mean you've some theory?"

"I was just wondering." Strange turned, moved down along the curb and watched the fire for a moment. It was raging in the debris of the farthestmost building, which had been completely demolished. The adjacent structure had been almost destroyed. Firemen were fighting to hold back the flames while rescuers carried out the injured and dead.

"God knows," Dreyton was saying dully, "we'll need any help we can get to fight this hellish thing. If you could give us a hand—"

"I'm afraid I'm out of it," Strange interrupted. The weariness of the past weeks had descended on him again. "I need a rest, commander. I've got to forget the war before it gets me."

"A queer problem used to be like wine to you," Dreyton said slowly. "There's more than I've told you." He stopped as a man in an R.N.A.S. uniform approached. The man was cursing, and his face had a sick look.

"What's the matter, Crane?" Dreyton demanded.

The Navy pilot turned, pointed back along the curb.

"Rob Wagner," he said thickly. "His wife and two children—the damned Huns—" his voice choked off.

Strange followed Dreyton's glance. In a space along the curb the hurrying rescue workers had laid a score of bodies. Some were mercifully covered. Near the last of that gruesome row stood a man in flying-clothes. By the glare of the flames his face was like white marble. Strange had to look twice before he recognized the man who had been in the Supermarine.

Men with stretchers came to carry away the dead. Slowly, that stark figure bent and lifted a tiny form. Unseen, he bore it past the spot where the three men stood. A film came before Strange's eyes as he saw a chubby hand...

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Moments later, when Wagner had gone, Strange faced the British commander. In Dreyton's tired eyes was a question.

Grimly, Philip Strange nodded.

CHAPTER II**THE PHANTOM WIRELESS**

MIST was still falling, and the Navy car made slow progress through the unlighted streets. Dreyton puffed at a cheroot and stared through the glass panel which separated the rear from the driver's seat. Strange had removed his helmet and gloves and was lounging back on the cushions. Now and then his green eyes flicked sidewise at the Englishman's profile. As the machine swung from Commercial Road into the confines of Whitechapel, he turned his head and looked absently into the gloom.

"A difficult thing to visualize," he said.

"Eh?" said Dreyton, obviously aroused from intense thought. "What do you mean?"

"A vanishing wireless," Strange answered.

Dreyton started so that he almost dropped his cheroot. "See here, Strange, if you already know about this thing—"

"Only what you've just told me," Strange interrupted.

"But I haven't said a word," Dreyton snapped angrily. "Confound it, I'd forgotten that mind-reading habit of yours!"

"Telepathy is a better word," Strange said. "After all, it's a rather simple phenomenon—a matter of two minds attuned, or *en rapport*, as the French have it."

Dreyton was still ruffled.

"It's all right for you to pass it off so calmly," he growled. "But I'm no 'Mental Marvel,' and it's deucedly annoying to have someone come right out with one's private thoughts."

Strange's lean, poker face did not

change, but back of the mask something hardened. Though Dreyton referred only to the nickname as it had become current in Allied Intelligence, it took the G-2 ace back to a childhood he had tried in vain to forget—a childhood which had been quite unpleasant.

Cursed, as it often seemed to him later, with a gift for lightning calculation plus an amazing memory, he had been publicized as a boy prodigy at the age of seven. Given difficult problems, he had been able to produce the answers swiftly, without being conscious of the intermediate steps involved. Later, this ability had extended to other than mathematical problems, resulting in a habit of quick deduction which would have made him a great detective if he had chosen that field.

But Fate had ordered otherwise. For the first few years of his life he had been saved from exploitation by a wise father who balanced his mental and physical life. But his father's death had left him in the hands of a grasping

uncle. For one unhappy year, driven at terrific pressure, he had been forced to learn a dozen languages, to master the violin, and to acquire a hundred flashy tricks that would appeal to the public.

After that, the stage, with Philip Strange billed as the "Mental Marvel of the Century." Tours in America, Europe, Asia. Hateful years until at last he had fled in sheer desperation.

Under a dozen names, he had roamed the world, rejoicing in new-found freedom. Travel had brought him new outlets for his uncanny mental powers. A Hindu guru had taught him Yoga secrets. A wise old Chinese doctor had added to his store of mystic and medical knowledge. And then the war . . . the lure of wings . . . a few unforgettable weeks at the stick of a fighting ship . . . But Intelligence had soon discovered his identity. In two hours he was on his way to Chaumont to become an agent in the flying section. Thus had begun the career of Captain Philip Strange—inevitably the "Mental Marvel of G-2."

FOR several moments after Dreyton's outburst, Strange was silent. Then he turned and said, a trifle coldly, "I'm sorry I startled you. You were thinking so near the surface that it seemed for an instant you had spoken."

Dreyton was at once contrite. "Forgive me, old man," he begged. "This affair has upset me badly. I'd give a good sum, you know, to have that keyed-up brain of yours. No wonder the Hun gives you a wide berth and puts a price on your head."

"The trouble is," said Strange, "I can't always count on telepathy. "Just now it was as though you were actually speaking. Sometimes it's just a vague impression—often only a blank."

"Not often enough to please the Boche, I wager," said Dreyton. "I'll never forget how you trapped von Heimer after he made fools of the rest of us."

"About this disappearing wireless," Strange came back to the matter at hand.

"The phrase is a misnomer," grunted the Englishman. "Since we've never been able to see the confounded set, it can't be said to have vanished. Invisible would be a better word."

"It operates here in London?" said Strange. It was more a statement than a question.

"At various spots. Right in the Royal Mint, according to the latest check-up," Dreyton told him wryly.

"That was today?"

"Right. It shifts around every time a new message is sent. We first heard it two weeks ago. It was obviously a spy station sending a code to Germany or to the U-boats. Our men took bearings on it and judged it to be in a house near Cannon Street and Cable. We practically tore the place apart, but found nothing.

"Next day at the same hour we heard it again—spotted it close to Fenchurch Street Station. While we were searching that area it was caught as sending

from down in Shadwell. Four hours later it buzzed out a message from a place ten streets away."

"You thought of a wireless set in a moving-van?" Strange queried.

Dreyton nodded gloomily. "Right. But we gave up that idea. The trail led into solid blocks of shops and houses where a push-cart couldn't have squeezed. Since then the blasted messages have been coming from everywhere in East End, right up into the city. I suppose the next one will be from the Lord Mayor's Mansion."

"You've decoded some of the messages?" Strange said tersely.

Dreyton hesitated. "Since you're working with us, I presume General Beale wouldn't object to my telling you.

Winners of Missing Words Contest No. 16

First Prize, GEORGE CODER, Williamsport, Pa.

Second Prize, JERRY MARESH, Chicago, Ill.

And Three Prizes, WILLIAM RICHTMYRE, Montclair, N. J., LEONARD SWANSON, Chico, Calif., G. W. FAY, Tower, Minn.

Honorable Mention: R. VERNON FAY, J. CLARK, EDWIN SIPOS, CHARLES PENN, JACK FEDOLE, BILL PIERCE, JACK KENDALL, FRED PAIGE, and AL VILLANUEVA.

This Contest Appeared in the August FLYING ACES

Our cipher men were stuck for ten days, then a chap named Fowler managed to crack the nut. Strange, those messages were dynamite! Reports on troop and supply-ship sailings, changes in Home Defense, and other secret orders."

In the last few moments Strange had shifted restlessly. He seemed hardly to be listening.

"How soon was the code changed after you broke it?" he inquired.

Dreyton did not catch the preoccupied note. "You guessed it," he growled. "It was changed on the very next message."

Strange suddenly reached forward and picked up the speaking-tube. He thrust it into Dreyton's hands.

"Order your man to turn right," he said abruptly.

"But that's not the way—"

"Quick!" snapped Strange.

The Englishman gave the order, and the car swung up past the Bank of England. Strange slipped his right hand inside his uniform blouse.

"Left—and faster!" he clipped out.

The driver obeyed the puzzled commander's order. As the car lurched forward, pedestrians crossing Gresham Street howled imprecations at the car speeding through the mist.

"I say!" yelled Dreyton. "In this dark we'll likely—"

His words broke in a gasp as Strange hurled him down to the floor. There was a vicious crack, as a slug from a silenced weapon cut through the glass

window in the rear. Strange's fingers had already closed on the flat little Luger under his arm. He twisted around, whipped the gun upward. The dark bulk of another car loomed alongside. He leveled the Luger and waited.

A report, barely more than a muffled hiss, came almost at once. Strange fired as the right rear window shattered. The other machine veered sharply. Strange jerked up on his elbow. Something was shining dully from a spot behind the driver of the murder-car. He aimed with swift precision. Two shots blazed from the Luger. The blurred shape behind the shining object twitched back into the car. A queer, wailing cry rose above the roar of the engines. Careening on two wheels, the assailant's machine whirled into Queen Street and was quickly lost in the fog from the Thames.

DREYTON'S driver, after a moment of fatal indecision, started in pursuit. But it was soon evident that the other car had escaped.

"No use," Strange said through the tube. "Go on to Adastral House."

Dreyton had regained his seat, but not his British equanimity. "An outrage!" he fumed. "An attack like that right in the streets of London."

"I'm afraid the Boche is no respecter of British dignity," Strange said in a dry voice. He turned and inspected the bullet-hole through the rear window. "H-m-m, about .50 caliber . . ."

"Good Lord, man!" Dreyton exploded. "If you knew we were being trailed why didn't you warn me?"

"I wasn't sure at first," Strange drew down the curtains, lit a cigarette. "By the way, don't tell anyone—even General Beale—about this."

"Why not?" demanded the Englishman.

Strange ignored the query.

"Did you noticed the peculiar death-cry made by our murderous friend?" he asked.

"Certainly, I'm not deaf," retorted Dreyton. "What about it?"

"I take it," said Strange, "that you've not seen service in China. That cry was made by a Chinaman."

Dreyton stared. "I don't believe it," he said flatly. "It's obvious to me that some Boche spy was there to see what damage had been done. He happened to recognize you and followed you with the idea of collecting the reward for your death."

Strange looked at the tip of his cigarette.

"There is no international law against a Chinaman's being a German spy."

"I think," muttered Dreyton, "that if I were in your boots I'd wear a disguise. I seem to recall you have a knack in that direction."

"Your efficient Scotland Yard would probably arrest me as a suspicious character," Strange said, grinning.

The car slowed. Dreyton lifted a curtain as the machine came to a stop. Uniformed men opened the door, and Strange recognized the entrance of the Hotel Cecil, one of the large hostleries

along the Embankment, which had been turned into headquarters for the R.F.C. By a perversion of the Royal Flying Corps motto, it had been nicknamed "Adastral House."

After warning his driver to keep silent about the shooting, Dreyton led the way into the lobby of the old hotel. They went up to the top floor and into a long room overlooking the Thames. The air was filled with cigar smoke, through which General Beale, the officer in charge of Home Defense, was fiercely pacing back and forth. A British lieutenant with a retreating chin and a wilted look stood unhappily at one side. As Dreyton and Strange came in, the red-faced old brigadier wheeled around.

"Well?" he rasped at the Navy man. "Worse than reported, sir," Dreyton answered despondently. "No one escaped from the first building, and only a few from the other."

The general swore. Then he peered from under shaggy brows at Strange. "You remember Captain Strange, from American Intelligence," began Dreyton.

Beale's eyes lit with a quick gleam. "Couldn't forget him," he growled. He thrust out his hand. "Did Dreyton pull you in on this mess?"

"I literally fell into it, General," Strange told him. He explained briefly about the fight. Beale spun around to the pallid lieutenant.

"Hear that, Mr. Smythe?" Lieutenant Smythe-Burrows stiffened as the Brigadier glared at him.

"At least two Boche ships—and you say you didn't hear a thing!"

"Neither did the other stations, sir," said Smythe-Burrows miserably. "I can't understand it."

General Beale jerked his thumb toward the door, and the hyphenated Briton scuttled out. The brigadier scowled after him. "Stuffed tailor's dummy! At that, I don't see how those Huns managed to steal up on us without anybody hearing them."

"British engines," Strange said laconically.

The general swore in disgust. "Why didn't you think of that?" he barked at Dreyton.

Strange concealed a grin. Brass Hats in London were no different than in Chaumont.

"What kind of planes were they?" Beale asked shortly.

"I saw only one clearly. It was an RS type Dornier. I think the other was a different ship. It had two guns firing through the prop while the RS usually has but one."

"Could you see anything of that infernal ray apparatus?" Dreyton put in.

"I saw some kind of electrical device," Strange answered. "It was in the rear of the glass-covered dual compartment." He glanced from the general to Dreyton. "Have you considered the idea of a projectile launched at terrific speed?"

"Impossible," grunted Beale. "It would have made an outlandish screech. Beside, we've a hundred reports that the flash of that ray and the destruction of the buildings were simultaneous."

"There's no doubt that the Boche has invented some hellish means of destruction," Dreyton agreed dolefully. "It's probably the thing we've all been searching for—explosion of the atom."

"It's an unholy mess," grated the general. "We're spreading the story that it was a huge bomb, but the truth will come out sooner or later. Then there'll be a real panic. Bombs are one thing. A death-ray is a different matter."

"There's something peculiar about this," Strange said thoughtfully. "According to Dreyton's idea, they weren't aiming at those particular buildings. Anything would have sufficed, just to start a panic."

The brigadier chewed on his cigar for a second.

"That's right. Except for the damage done in lives lost, the damned Huns didn't gain anything by hitting that spot."

"Then why," Strange asked calmly, "did they go to the trouble of dropping a flare, and also risk being shot down at that low altitude by diving under the flare?"

Beale scratched his chin, frowned. "Maybe there was some reason for hitting those buildings, after all. Several Navy pilots on the Thames patrol lived down there to be near their stations."

Strange shook his head. "They could have selected a far more important target—this headquarters, for instance. No, General, there's only one explanation. That Dornier had to be seen."

"I don't understand," growled Beale.

CHAPTER III

ZIGZAG OF DESTRUCTION

STRANGE had turned toward the wall at his left, which was completely covered with an enormous map of London and its environs. "These red circles are the temporary locations of your perambulating wireless?" he asked Dreyton.

"Yes," said the commander. He looked apologetically at Beale. "I explained about that matter, sir."

"Any ideas?" Beale shot at Strange. Strange was tracing some pencil lines which crisscrossed between the circles. "Some one tried to hook these up by alleys and streets, I see."

"It was Lieutenant Fowler's first idea, that they were using a van," explained Dreyton.

"The chap who decoded the messages? And what was his second theory?"

"That it must be a small, compact set which could be plugged into an ordinary light socket and carried about in a satchel."

"Ingenious idea," nodded Strange. "By the way, I'd like to see the original code messages, particularly the first one decoded."

"I'll have to send for Fowler," said Beale. He gave terse directions by phone. "He's not a regular cipher man. It was his specialty as a Naval Reservist before the war, but he wanted to fly, so they let him take training on

condition he'd stay in Home Defense, where he could do code work, too."

Strange picked up an eraser and removed the pencil lines between the red circles. After a short scrutiny he set to work, connecting the marks with a single, zigzag line.

"What are you up to?" Dreyton asked with a shade of annoyance.

Strange's green eyes were riveted on one spot which the line bisected. He turned abruptly. "Commander, how soon can you get Wagner here?"

"That poor fellow who lost his family? Surely, at a time like this—"

"It's important," Strange interrupted.

Dreyton shrugged, went to one of the telephones on Beale's desk. While he was making the call, Strange turned to the brigadier.

"A burning plane crashed during that fight tonight. Have you had a report on it, sir?"

"Yes, it was a Supermarine from Number Three station."

Strange looked at the map. "On the Limehouse bank of the river," he muttered to himself. "Wagner's station, too—he dived in that direction." He pivoted, and now the last vestige of weariness was gone from his face. His green eyes were sharply alert. "Have there been any other pilots killed in action at that station?" he asked swiftly.

Beale stared at him. "Why did you ask that?"

"Then there were," Strange snapped, forgetting the other man's rank. But Beale took no offense.

"We've lost five seaplane pilots in the last month," he admitted. "But only one in action—a petrol tank explosion during a fight against Gothas. Another man committed suicide—was found dead in Hyde Park at three in the morning, shot with his own service pistol. The other pilot from Number Three station has been missing for more than two weeks."

THE light in Strange's eyes had increased until it was almost a flame. But at the general's last words a blank look came into his face.

"The other two were not from the Limehouse station?"

"No, from Number Two—beyond Blackwall Reach. They were testing a new plane, and it crashed."

"One more question, General: How long has Wagner been attached to the Limehouse station?"

Dreyton had returned.

"I can answer that," he said. "He and Fowler were transferred there three weeks ago."

"From Number Two station?" rapped Strange.

"Right," said Dreyton, a little nettled. "But Wagner has been off duty until today, with a leg injury. Because of this threat from the code message, we put all pilots on emergency patrol tonight."

"Do you have that message here?"

General Beale strode to his desk, returned with a paper.

"Here's the decoded copy."

Strange glanced quickly at the words:

QQX QQX QQX Orders received Details carried out Communications still intact Regarding new air weapon make first test on London direct Hour eleven night of twenty-first. Regardless of weather strike precisely on the hour.

Z-13

Strange whistled softly as he saw the code signature.

"What is it?" demanded Beale.

"Z-13 happens to be Karl von Zenden—and von Zenden has been in Vincennes prison for the last ten days."

"But this message was received only a week ago," said the brigadier, puzzled. "How could he send it from London if—"

From out in the night came a faint moaning sound. It grew swiftly into the howl of a diving plane. The staccato pound of machine guns cut through the shriek of the ship. General Beale leaped toward the door to the hall.

"Come on!" he bellowed over his shoulder. "Follow me up to the roof!"

Strange and Dreyton dashed after him. When they reached the roof, searchlights were beginning to poke through the mist. A Supermarine roared through one hazy beam, zoomed steeply with guns blazing. It vanished in the murk before the searchlight could follow. From the lowering clouds came the sound of a furious battle. More searchlights lanced through the gloom. The rattle of guns suddenly ended. The next instant, the Supermarine whirled into view, wings flailing around in a spin.

"The devils got him!" raged Beale.

"No, he's pulling out, sir," exclaimed Dreyton.

Strange gave a lightning glance at the seaplane, then gazed off toward East End. A minute passed. Dreyton plucked at his arm.

"We're going below. Come along."

"Wait!" Strange said tautly.

The word was hardly spoken when the sky three miles to the East was lit by a bright blue flash. As Strange and the others stood rigid, a deep, ominous roar came to their ears.

"Great God!" cried Dreyton. "They've done it again!"

With an oath, General Beale turned and plunged down the steps. Dreyton followed quickly. Strange stood as though in a Yoga trance till several minutes had gone. Then he slowly turned to the steps. He was almost at the bottom when another grinding roar sounded across the distance.

Telephone buzzers were rasping fiercely as he reached the office. Dreyton was trying to answer two phones at once. Beale snatched up a third.

"Operator! Never mind those damned scared rabbit calls! Keep these wires open for reports!"

In a minute the locations of both the latest disasters had been reported.

"What did the butchers hit?" roared Beale, as Dreyton put down the phone.

Dreyton turned and jabbed his finger at a spot on the huge wall-map.

"A warehouse here, and two shops up

on Leadenhall about here—" he stopped, stared around at Strange. "Look here!" he said tensely.

"I know," said Strange. "The zigzag line."

"All three places are on that line you drew," whispered Dreyton. "What does it mean?"

Before Strange could reply, the door burst open and two Staff officers charged in, panting.

"Good Heavens, Beale, do something!" gasped one of them. "The Germans are wrecking London!"

"I'm doing all I can!" thundered the brigadier. "All our defense planes are up, but with this rain and fog—"

An excited aide popped into the room. "There's a fight reported up over Hackney Marsh, sir! They must've cornered the Boche!"

STRANGE had stood like a graven image, eyes fixed on the map of London. He wheeled suddenly, grasped Dreyton's arm, and propelled him toward the door.

"I say," sputtered the Englishman. "What are you—"

"I'll explain as we go. I've a hunch that fight over Hackney Marsh is a trick to draw attention."

Beale's aide shouted something after them as they made for the stairs, but Strange did not even turn. "I want a fast boat," he told the bewildered Dreyton. "Where's the nearest place?"

"There'll be a police boat up the Embankment near Charing Cross foot-bridge—"

"Perfect! Let's go!"

They dashed through the lobby, past staring guards, and into Dreyton's car. In hardly more than a minute the Englishman was hastily explaining their needs to a grizzled Thames police officer. Thirty seconds later a fast police boat was churning out into the mist.

"Full open," Strange flung at the coxwain.

"Gorblimey, sir, in this blahrsted fog?" gasped the man at the wheel.

"Commander Dreyton will be responsible," said Strange.

Dreyton groaned. The boat roared ahead, now and then completely enveloped in mist, occasionally in a space where they could see.

"Would you mind telling me where we're headed for?" Dreyton demanded aggrievedly.

"Your Number Three station, in Limehouse."

"You mean we're flying?"

"I don't know," Strange said grimly. He gripped the gunwhale of the boat, leaned close to the commander. "To save time, you might answer a couple of questions. First, do you know whether there has been any unusual number of missing persons reported at Scotland Yard?"

"Not that I know of," grunted the Englishman.

Strange frowned into the gloom. Then suddenly he snapped his fingers. "Coolies, of course!" he muttered. "Nobody would notice, and Limehouse wouldn't talk—"

"Can't hear you!" shouted Dreyton above the engine roar.

Strange swept his hand toward the north bank of the Thames. "If you were a Boche, and you had just one shot with that 'death-ray', what would be your target?"

"Buckingham Palace," said Dreyton. "Destroying the King would shake morale worse than—Good Lord, Strange! You don't think . . . ?"

"No, it's hardly the Palace."

The police-boat swerved, just missing a tug with a barge in tow. At reduced speed, it turned in toward the Limehouse shore. A ghostly pier loomed, faded back into the mists. They passed another landing and a warehouse at the water's edge. Then several red and green lights winked hazily through the patchy fog.

"Take-off lane," Dreyton said tersely.

The police-boat swung out and curved back between the lights. The seaplane station consisted of a wide, wooden ramp leading up to an old warehouse which had been converted into an emergency hangar. A Supermarine three-seater was drawn up on the ramp, and as the police-boat idled into the landing a petty officer popped up from the two-place pilot compartment.

"Ere now!" he exclaimed, jumping down to the ramp. "No boats allowed in the tyke-off strip."

"You're a bit late, my man," Dreyton said curtly as he stepped from the launch. "Better have your hearing tested."

The petty officer switched on a flashlight and came forward with jaw set belligerently. Then he saw Dreyton's gold stripes.

"Beggin' yer pardon, commander," he said with a stiff salute. "I was listenin' to the wireless here like Mr. Fowler said."

"Where's the lieutenant now?" clipped Dreyton.

"He's pushed off to Headquarters, sir. Got a call 'arf an hour back."

"Then he wasn't on patrol?"

"No, 'e was stand-by, sir—'ere, wot are you about?"

Strange had stepped onto the flared hull of the seaplane and was reaching down into the pilots' compartment. He lifted a wireless headset and held one phone against his ear. No signals were coming in. He bent down, stepped back to the ramp with a memorandum clipboard to which was attached a sheet of paper. Dreyton glanced quickly at the code letter-groups the enlisted man had taken down.

"By George!" he said. Then, *sotto voce* to Strange, "It's from that mystery station!"

"Then there's a directional short-wave set in this plane?"

Dreyton nodded. "I just remembered. Fowler had an idea of taking bearings on the spy-set and trying to locate it that way."

"Then why not try it now?" Strange demanded in a voice audible to the entire group. "If that station is sending tonight." He wheeled to the petty

officer. "Get mechanics out here and start up this ship."

CHAPTER IV

"WHERE IS VON KRIEME?"

AT Dreyton's affirmative nod, the man disappeared within the converted warehouse. After a short interval, two mechanics came out to the ramp, struggling into oil-stained dungarees. A Lewis twin-mount was placed in the Scaarf-ring in the bow. As one man warmed up the two Cosmos radials, Strange beckoned to the other.

"Bring out two sets of flying-gear and an extra pair of goggles."

Dreyton cocked a shrewd eye at Strange as they waited near the police-boat. "Just what are you really up to?" he inquired.

Strange looked at him soberly. "Are you willing to take a risk of being shot up?"

"If it helps to get at the bottom of this devilish business, yes."

The petty officer returned just as the mechanic brought out the flying kits. Strange drew his helmet from the pocket of his leather coat, took the extra pair of goggles.

"Who's the third kit for?" Dreyton asked as he donned a Sidcot suit.

Strange motioned to the petty officer, who was preparing to help launch the plane. "Jump into this gear," he said crisply. "I'll need your help on the wireless."

"But I cawn't rightly go, sir," the man objected. "Leftenant Fowler, 'e put me on the stand-by—"

"One of these men will take the duty," Dreyton cut in impatiently.

The man's face, a pallid blur in the gloom, twitched up toward the somber sky. "We're like to break our bloomin' necks, sir," he said hoarsely, "a-flyin' in this 'ere fog."

Dreyton moved toward him ominously. "Are you refusing duty?"

The man's mouth opened, and closed. Sullenly, he put on the suit and a helmet. Strange gestured to the right-hand bucket seat, and after a word to the police-boat sergeant, took the other seat. With Dreyton hunched low in the bow cockpit, the Supermarine rolled down the ramp and slid free of its cradle. Strange cracked the throttles, and the seaplane droned out between the red and green lights. The petty officer was fumbling with his safety-belt. Strange flicked a glance over his shoulder. The station had been swallowed up in the mist. He leaned toward the man at his side.

"Better fasten that belt tighter. You won't be able to hang on after we get up there."

The man's head jerked up. As he saw the look on that lean face so close to his he started to snatch at his side. From the darkness of the cockpit whizzed a fist. It landed with sledge-hammer force on the petty officer's jaw.

Strange caught the man's limp body. Holding it upright, he wedged the

man's arms at his sides and snapped the safety-belt in place. Then he calmly drew on his gloves and taxied into the wind. Several feet forward, Commander Dreyton raised his head from the shadowy bow pit.

"All set?" he bellowed back, quite unaware of the change in the petty officer's status.

Strange smiled sidewise at his companion. "All set," he shouted, and switched on the wing-tip lights.

Twin yellow tunnels bored through the fine mist, showing the Thames' black surface. The throttles went forward under Strange's hand, and the Cosmos motors responded with a roar and a surge of power. The Supermarine ploughed through the grudging waves, climbed onto the hull's double-step, and soared up into the night. The wing-tip lights went dark.

Strange climbed steeply until he was sure he had cleared the West India Docks. At four hundred feet he switched on the short-wave wireless and secured the head-set under his helmet. His green eyes lit grimly as he caught the swift buzz of code. They were not wasting much time . . .

He circled tightly until he found the point at which the signals were loudest. The compass read 280. The Supermarine dropped in a sudden dive. A street intersection flashed into view, perilously close below. One look, and Strange hurled the ship into a fast chandelle.

OFF toward Hackney Marsh, searchlights showed vaguely through breaks in the fog. The rest of London was dark. Strange wiped the mist from his goggles, bent over the "Dep" control wheel. They would count on him to fly straight over the hidden station. He would have perhaps a minute before they sprang the trap . . .

A blue-white crescent glowed through the mist below. It widened, became a dazzling eye. Another searchlight from somewhere along the Thames speared up to catch the seaplane with its brilliant tip. Strange had rolled violently as the first light appeared.

"Fool!" he snarled at himself. "I should have known I couldn't keep on outguessing that clever mind!"

The tracers came like phosphorescent rain. But for that lightning turn, one burst would have been enough. The fiery streaks leaped off through the left wing-tip. Strange reversed with a jerk that all but snapped the neck of the inert figure beside him. The rudder jumped under his feet as bullets pounded the tail.

The seaplane leaped up as though hurled by a catapult. A darting shape sheered away as the three-seater zoomed. Against the twisting searchlights, Strange saw a smaller plane, a "Baby" Supermarine.

Dreyton had jumped up to his twin Lewis, but as he saw the attacker he instantly slacked the trigger. The single-seater pitched back in an Immelmann. Strange drove the heavier ship up after it.

"Get him!" he shouted at Dreyton, but the Englishman held his fire.

The mica wind-screen ripped to pieces before Strange's eyes. Fragments of laminated wood flew into his face as a murderous torrent poured into the three-seater's cowl. Shrieking, the other ship drilled down to finish them off. A blast of tracers caught the tip of one wing, marched redly in toward the center. Dreyton was wildly waving his arms at the fighter pilot.

Strange spun the wheel, stood up on the rudder. The three-seater whirled like a Spad. The fighter overshot, and for an instant the larger ship was out of the searchlights' glare. Strange jerked the throttles, banged the cowl with his fist.

"Get busy on those guns!" he flung at the Englishman.

"But he's one of our patrol! He must think we're—"

"He's a Boche!" Strange rasped. "Get him—or he'll get us!"

As the Cosmos motors thundered on, he heard a muffled pounding. He kicked the ship to one side. His swift surmise of the German's move was all that saved their lives. A stream of smoking bullets gouged up through the hull, ripping one flare wide open. Through the jagged hole, Strange saw two blazing guns. The fighter had pulled up in the blind spot, was hanging there, half-stalled.

The Dep control whirled under Strange's fingers. With rudder and flippers crossed, the three-seater groaned in a vertical bank. Two cherry-red lines stabbed down from the bow cockpit. Dreyton had at last gone into action.

The pilot of the fighter tried to sheer away, but he had waited too long. The stalling plane wobbled, slid backward on its tail. Hanging out on his belt, Dreyton poured burst after burst at the falling ship. One of the searchlights hastily shifted, driving its massed brilliance up at the plunging three-seater. Strange swore, and ruddered away from the beam. As it pounced after him he banked sharply and let the plane slip toward the ground.

Against the second light, which was darting about wildly, Strange saw a blurred silhouette of the plane which had attacked them. The fighter had recovered from the whipstall at a low altitude. As he charged toward it, the pilot hurriedly banked to the East.

The seaplane-fighter normally would have been the faster ship, but one of Dreyton's bursts had hit the Hispano motor. In less than ten seconds, Strange had the fighter within good firing-range. As Dreyton's tracers began to chop through his wings, the other pilot frantically skidded. Strange saw the man look fearfully over his shoulder. The fighter dived headlong for the foggiest part of the Thames.

Dreyton stood up, relaxing his hold on the guns. In a flash the fighter chandelled. The two guns in its nose scorched out a fusillade. Dreyton fell backward. For a second, Strange thought that the Englishman had been

killed. Then Dreyton's head reappeared above the cowlings.

With bullets gouging the hull not a foot from where he crouched, he swung the Lewises. Even in that tense moment, Strange had time to admire the Englishman's cool courage. As though it were target practice, Dreyton calmly aligned his sights and squeezed the trigger. The flashing streaks from the twin-mount seemed to tangle with those from the fighter. The other plane shot up at a crazy angle, its narrow hull exposed.

Like a surgeon intent on a clean incision, Dreyton leveled his guns. Raked from bow to rudder, the fighter fell off and burst into gushing flame. As it whirled on down, the blaze dissolved the mist which billowed about it. Strange saw it crash near the south bank of the Thames. Water spouted up, nearly quenching the fire. Rivulets of blazing gasoline spread out on the surface. Strange climbed up to five hundred feet, throttled the engines.

"How deep is the water in front of that ramp?" he shouted at Dreyton.

The Englishman was wrapping a handkerchief around his left forearm.

"A good ten feet," he answered.

"Then be ready for a ducking," Strange said, and nosed the seaplane down. As he glided toward the station, he caught a movement from the corner of his eye. The petty officer had recovered from the blow, was furtively trying to free himself. Strange lifted his hand from the throttles, balled it into a fist. The man shrank back against his seat. Strange gave him a grim nod, turned back to the controls.

BY now, a score of searchlights were sweeping the Thames. Strange had no difficulty in finding the station, but he switched on the wing lights for the tricky landing. Four feet above the water, the Supermarine thundered straight for the shore. A little crowd of men at the top of the ramp quickly broke to both sides.

Two hundred feet from the ramp, Strange closed the master-switch. As the engines died, he hauled back on the wheel. The three-seater's bow went up steeply, hung there for a second. As it dropped there was a dull crash. The flared side of the hull, already half-wrecked, crumpled from the impact. A flood of water poured into the hull, and the ship lurched to a stop.

The suddenness of that stop threw Dreyton headlong into the water. Strange snapped open his belt as the water began to rise about his knees. He took a hasty look, saw that men were running down the ramp to aid the commander. He turned to his captive. The petty officer was struggling frenziedly to release himself, but the safety-belt had been drawn too tightly about his arms. Without a word, Strange started to climb from the sinking plane. There was a choked cry behind him.

"*Mein Gott!* You can't leave me to drown!"

Strange jumped back into the half-filled compartment.

"I thought that would bring the German out of you! Quick—your name and K.N.A. number?"

"Save me first!" moaned the other man. "I'll tell you anything—"

"Talk now!" Strange said grimly.

The water was almost at the German's shoulders.

"Hans Abrams—Q-41!" he cried out wildly.

"Where is von Krieme?"

The German's eyes were bulging.

"*Lieber Gott*, if I tell—" the word ended in a gurgle as the water reached the man's lips.

Strange swore under his breath as he reached down and flicked open the safety-belt. If he had only thought of that important question first!

The seaplane shuddered, quickly went to the bottom. As Strange pushed up through the cold water, Abrams shot to the surface. The spy drew a gasping breath, looked wildly about him, and struck off into the river. Strange overhauled him within thirty feet. Abrams struck back to free himself as Strange's arm went around his neck. The struggle was short-lived. Half a minute later Strange dumped the man upon the ramp. Dreyton and the men from the police-boat stared at the spy's bruised face.

"Good Heaven!" exclaimed the English commander. "Did you have to do that to save him?"

"It wasn't panic you saw out there," Strange said shortly. He pulled the half-conscious man to his feet, motioned to the police. "Take him up to the flight office."

"But I don't understand," Dreyton said, bewildered.

"He's a German spy," Strange explained tersely. "There had to be at least one at this station. It would be the only way to explain that unusual number of 'accidents.' They were getting rid of pilots who might notice too much."

"Are you sure of this?" gasped Dreyton.

Strange paused to wring out his dripping blouse before he answered. "Yes, I'm positive. I suspected him after that hasty explanation about the code. I gave him a chance to communicate with the chief spy back of all this when I sent him into the hangar. You'll remember he took a long time returning. He was obviously calling to a spy hide-out here in London. Some one sent orders by that special code, on your 'vanishing wireless,' for the trap I stumbled into. I think I caught part of the message after we took off, though I can't swear that's what it was. That's why this man was afraid to go with us. He knew we were slated to be killed in the air. He was getting ready to shoot me when I knocked him out," and Strange told Dreyton how he had trussed up the German.

As they reached the flight office Strange looked around quickly. "Where are the mechanics?" he demanded of the police sergeant.

"They was here a bit ago, sir," the man said, puzzled. "I'll take a look about."

"Take two men with you, and have your guns ready. They've probably skipped out, but be prepared." As the three men went out, he turned to Dreyton. "What's the night complement of mechanics here?"

"Ten, including the petty officer in charge. Don't tell me you think they're all spies?"

"We saw only two," Strange said absently. He went on into the room where Abrams had been taken. The spy was huddled in a chair, water dripping from head to foot. He was breathing heavily, and in his dull blue eyes was the look of a cornered rat. Strange motioned aside the two policemen who guarded the man. Abrams lurched to his feet, cowered back toward the wall as Strange approached.

"Where is the base?" Strange fired at him.

The spy turned wildly to Dreyton. "S'help me, sir—the man's gone orf his nut. I ain't doin' nothing, an' he up an' belts me—"

"You can omit the cockney dialect, *Herr Abrams*," Strange said coldly. "You have already admitted you are Number Q-41 in His Majesty's *Nachrichtendienst*."

He had expected more bluffing on the part of the spy. Instead, a terrible pallor came into the man's wet face.

"No, no!" he whispered hoarsely. "Don't say any more—take me away—"

CHAPTER V

"VON KRIEME—IS—IN—LEE—"

THE inner door of the flight office opened, and the three policemen came in from the converted warehouse. "Neither hide nor hair of 'em, sir," reported the senior man. "There's a door to an alley, and it's standing open—"

"Bar it and keep it guarded," Strange ordered. He wheeled back to the German. For a moment he stood there, his eyes seeming to probe to the man's very soul. Then he abruptly crossed to a desk on which stood a shaded electric lamp. Carrying the lamp to the limit of the extension cord, he shone its glow straight into the captive's face.

"Hold it there," he directed a gaping policeman. Then he stepped around the light, and into his green eyes came a hypnotic stare.

"Look at me, Abrams," he commanded.

The spy's frightened eyes twitched toward him, seeing only Strange's head as it projected into the glow. For an instant he gazed with a taut defiance, then slowly the expression faded and there came a glassy look. Strange waited, watching that dead look deepen. At last he reached out and lifted the spy's left arm. It remained rigidly outstretched, its shadow like a semaphore on the shuttered window.

"Now," said Strange in a voice that was oddly quiet, "tell me: *Where is von Krieme?*"

Under the swift lash of the four last words, the spy's whole body stiffened.

Perspiration stood glistening on his brow, then slowly his lips began to move.

"Von Krieme—is—in—lee—"

A queer, dull sound broke into his laboring breath. Part of the shutter behind him cracked and fell to the floor. A gray and horrible look came into the German's face. Then he crumpled at Strange's feet.

As Abrams' knees buckled, Strange jumped back and struck the light from the policeman's hand.

"Get back!" he said tensely. "Through the door to the hangar!" Feet scuffled hastily in the dark. Strange was the last one through. "Get to that alley-way and don't let anyone past!" he directed three policemen.

With Dreyton and another policeman at his heels, he ran toward the big door at the top of the ramp. He was passing the shuttered windows of the flight-office, when he remembered he had lost his gun in the water. Nor were the London police armed, he grimly recalled.

There was a space of eight feet between the wall of the warehouse and the wall of a smaller building beyond. A feeling of menace came over Strange the instant he reached the corner. He could have sworn that unseen eyes watched his progress between those forbidding walls. But no shot came out of the blackness, and when he reached the alley he found the three policemen blocking the way.

"Must have escaped before they reached the alley," he said glumly to Dreyton.

"Or else he took to the river," ventured the Englishman.

Again that feeling of evil struck forcibly upon Strange's sensitive brain. It was as though hidden foes lurked nearby, yet there was no sign of a hiding-place. The wall facing the warehouse was absolutely blank, and the brief passage of a policeman's flashlight over the building across the alley showed only barren brick.

"Put out your light," he told the man succinctly. "Three of you stay here while—"

With a loud rumble, an Army reconnaissance truck swung into the gloom of the alley. It jolted to a stop, and a dozen Home Defense guardsmen leaped out. A guard lieutenant dashed up with a drawn pistol.

"What's the trouble?" he asked curtly.

Flashlights lit up on both sides. The guard officer was taken aback at sight of the police and Dreyton's gold stripes.

"Then you've already arrested the spies?" he blurted out.

"Who told you about them?" demanded Dreyton.

"Why, sir, one of the pilots from here came in like a crazy man—"

The arrival of a second guard truck drowned his words. A wild-eyed figure leaped from the seat beside the driver. A light showed the white, distorted face of Lieutenant Wagner. The pilot came to a sudden halt in front of

Dreyton. His staring eyes rolled about the group.

"Where is he?" he snarled. "Don't try to hide him, or by God—"

DREYTON drew the half-crazed man aside, motioned for Strange to go inside with them. As they neared the front of the improvised hangar, Wagner whirled fiercely.

"Damn him, you've let him escape!" he rasped.

"Take it easy, my boy," Dreyton said quietly. "If you want to help us get the guilty men, tell us what you know."

The stricken man looked at him with eyes like burning coals.

"It was Martyn," he whispered, half to himself. "I knew all along something was wrong. Tonight that Dornier—" a spasm twitched his lips—"he was defending it in that fight! He knew—he knew what was coming—" the pilot's face convulsed in a paroxysm of horror.

"Is Martyn one of the pilots at this station?" Strange asked Dreyton in an undertone.

"He's a butchering spy!" Wagner flung out almost in a scream. "He guided them—the fiends who killed my—" his voice choked in his throat. He turned and stumbled blindly out toward the ramp platform.

Dreyton started to follow, but Strange shook his head.

"Let him alone, poor devil. He told me as much as I expected. If he knows anything else, we can get it later."

The guardsman officer and the police sergeant were examining Abrams' body as Strange and Dreyton entered the flight office. The sergeant stood up, pointed to a hideous wound in the back of the spy's head.

"Clear case, sir," he said to the commander. "Whoever done 'im is a stand-in' right outside. Had a pistol—a big one, by th' look of this hole—and there must've been one of them silencers on it."

Strange bent and eyed the gruesome wound. The bullet had obviously been of large caliber. It had entered at the steep angle, traveling down so that he estimated it was lodged near the left collar-bone. He stood up. Dreyton noticed his quick glance at the hole in the shutter.

"By Jove!" he exclaimed. "The shutters were slanted up. How on earth—"

"You're right," Strange said abruptly. "The man must have been a giant."

The interruption had been intentional. For the second time since he had entered the room he had felt that some one nearby was listening hostilely to every word that was spoken. But Dreyton was not so easily diverted.

"But even at that," he objected. "I don't see how—"

From somewhere at the front of the building a choked cry was audible. A splash followed, then a commotion arose as guardsmen and police ran in that direction.

"It was that flying bloke," one of the Tommies exclaimed as Strange reached the small-boat pier. "He was

'ere a minute ago—'e must have slipped an' fell in."

A minute elapsed before the police-boat could back out of the take-off lane and make a search. Its light swerved back and forth through the low-drifting masses of fog. There was no sign of the missing pilot.

"A bad place," Dreyton said in a grave tone. "There's a strong eddy along here—something about the current."

Strange met the Englishman's eyes. "Suicide?" he said soberly.

"I'm afraid so—he was almost out of his mind, you noticed."

STRANGE did not answer. They waited half an hour, while searchlights from two batteries along the Thames helped to comb the water for the pilot's body. Strange spoke to the commander in a low voice. Dreyton went inside, returned in a few minutes.

"Strange, those searchlight crews swear that Headquarters phoned them the three-seater was flown by spies! That's why they spotted us in that fight."

"Fast thinking," Strange muttered. "We are up against a clever man, and no mistake."

The awed hush which had descended over the assembled men during the search for the pilot's body was broken by the roar of a high-powered car. In a moment, the guardsman officer trotted excitedly out to the ramp.

"General Beale has arrived, sir," he said to Dreyton. "He wants to see you and the American officer right away."

The gruff old brigadier had just reached the flight office as they entered the other door. His stern eyes flashed over the dead German.

"Spy?" he grunted. Then, at Dreyton's affirmative, "Well, where are the others? Let's get at them!"

He stared blankly as Dreyton made reluctant explanation.

"You idiot!" he roared. "Had them right in your hands, then you muffed it!"

Dreyton flushed. "Sorry, General—" "Sorry be damned! If you'd given me any idea of this instead of dashing off—"

"It was my fault, sir," Strange said quickly. "But everything isn't lost."

"Thank the Lord for that! It was bad enough with these disasters in East End, but when that devilish blue ray hit Chelsea and Kensington—"

"What?" Strange shouted.

"That's what I said!" General Beale roared back. "One in each place, and a third across the Thames, somewhere out in Lambeth."

Strange stood dumbfounded. It was not the first time that he had had a theory smashed. But never had it come with such crushing force. There had been fragments to pick up...

"Well," barked the Home Defense brigadier. "Let's hear what you've found out."

For a second Strange seemed not to have heard. Then his green eyes wearily lifted.

"Not a single thing," he said.

CHAPTER VI

"LONDON VANISHED AND VANISHING"

IT was mid-afternoon, and the feeble sun which had been trying to pierce the gray clouds was finally obscured in a smoky pall. Vans and busses rumbled through the teeming streets, as though hastening to reach their destinations before the fog should settle again.

There was one room in London to which no sound of the busy streets came. It was like a tomb, and the somber figure behind the teakwood desk might have been a statue. But suddenly a muffled buzzer sounded, and at once that statue came to life. A long yellow finger touched a hidden switch under the edge of the desk, and a panel slid open in a lacquered cabinet in one corner. One of several small electric bulbs was glowing brightly.

"Second report on Captain Strange," a subdued voice spoke from the cabinet. There was a pause. "Period from noon to three-fifteen. Lunched at Savoy, where registered as Lieutenant Pete Smith, U.S.A. Met Commander Dreyton at 1:45. Went to Adastral House for conference with Lieutenant Fowler. Fowler has just left. Captain Strange and Commander Dreyton still in headquarters."

The panel closed, and then a red light flickered. The man at the desk opened a drawer and took up a one-piece telephone.

"Yes?" he said sharply in a foreign tongue.

"There is no danger," a voice said hurriedly. "He is as far from the truth as the British."

"You are positive?" demanded the man at the desk.

"I am certain. He has guessed the existence of K, and he knows something unusual is planned. But nothing else."

The slanting eyes of the man at the desk had narrowed at mention of "K."

"He has taken no other steps?"

"Only to sit and stare at the latest map of London."

"So long as he does not look at an older map, it is safe enough. Report any other movements he makes."

The slant-eyed figure replaced the phone and laughed softly to himself.

"I'm afraid, my Brain-Devil friend, that your mind has lost its cunning."

BIG BEN had just boomed the hour of three. Philip Strange morosely turned away from the window of Dreyton's office and squashed out his cigarette.

"Sorry I let you down, Commander." In the brief pause which followed, he glanced from the glum there-striper to the tall, dapper lieutenant fidgeting in a nearby chair. "Don't ever go in for Intelligence work, Fowler," he said bitterly. "People expect you to perform miracles."

Fowler's smooth pink cheeks showed a faintly embarrassed flush.

"I suppose, sir, it's because of your reputation."

Dreyton lifted bloodshot eyes to Strange's face. "I never asked for a

miracle," he stated grumpily. "But you seemed so hot on the trail—"

"Until the trail whipped back and caught me in the eye," Strange said dourly. He lit another cigarette, stared at the litter of paper on Dreyton's desk. "I can tell you one or two points, but they don't lead anywhere. There's obviously a German spy-ring working on some big scheme here in London. The leader is Nikolaus von Krieme, one of the smartest men in Boche Intelligence. He's the one who sent that message signed Z-13, intended to divert any search from himself. He didn't know that von Zenden had been caught."

"Then you believe, Captain," asked Fowler, "that the spies intended us to read those code messages?"

Strange nodded. "With all respect to your ability, that message about the new air weapon was sure to be solved. The nulls and variants of the preceding messages were almost entirely lacking."

Fowler looked somewhat offended.

"As for von Krieme," Strange went on, "I happen to know his habits. He is peculiarly fond of the Lang-Schutts breakdown air rifle, which was demonstrated to us in Gresham Street last night. He has lived in China, and twice I have found him using Chinese as spies in Paris. He has a genius for counter-check, which has been painfully evident here, and finally I know that G-2 lost his trail in Belgium just a week before your mystery wireless began operating. He fits the picture, such as it is," he added ironically.

"All of which doesn't help in this death-ray matter," grumbled Dreyton.

Strange returned to his silent gazing from the window. In a few minutes Fowler stood up.

"If you don't need me any more, I'll get back to the Cipher Bureau."

He departed. Strange waited, gazing down at the Embankment until he saw the man emerge. He turned briskly to Dreyton.

"Now," he said, "we can talk plainly while our young friend makes his report to von Krieme."

The words did not register instantly. When they did, the Englishman's jaw sagged in amazement. Strange grinned.

"An unusual young fellow, Commander. You should be more careful, even in peacetime, about your Naval Reserve."

"But that's impossible!" sputtered Dreyton.

"I'll prove it tonight—with your assistance."

Strange had barely started to explain his plan when Dreyton's telephone rang. The commander took the message, held his hand over the transmitter, and looked at Strange.

"Wagner's uniform coat was just found in the Thames, near London Bridge—"

Strange leaped up as though electrified.

"London Bridge! Are you sure you got it right?"

Dreyton turned back to the phone. When he put it down he gave a puzzled nod.

"That's where it was found. It's

rather curious—the sleeves were tied together."

Strange's green eyes blazed. "No message in the coat, of course?"

"Nothing—"

"That means he didn't have time—they must have been close—" Strange spun around and gazed at the map on the table.

"I don't understand how it got up that far from Limehouse," Dreyton was saying thoughtfully. "The tide wasn't enough—"

Strange cut him short with an exclamation.

"There's a book called *London Vanished and Vanishing*. I want a copy immediately, but nobody's to know whom it's for."

"I have a messenger I can trust," Dreyton said quickly.

"Wait. Tell him to get copies of the earliest known maps of London, also Smith's *Ancient Topography*."

As the messenger hastened out, a minute later, Dreyton wheeled to Strange.

"Now, would you mind explaining what you're up to this time?"

In answer, Strange jabbed his finger at the map. He began to talk, tersely; and as he hurried on, Dreyton's face slowly lost its color until it was deathly white.

"My God!" he whispered. "If you're right—"

"It's the only answer. I should have seen it before. But we can't tell Beale. He'd turn the town upside down. One hint to von Krieme that we've guessed, and he might rush his plans."

"But how in Heaven's name can we find that devil in time?" groaned Dreyton.

Strange picked up his overseas cap and gestured toward the door. "I think we'll find the answer in the back of Hans Abrams' head."

IT was only seven o'clock, but a murk of cloud and gathering fog made the city like night. The taxicab stopped midway on West India Dock Road, and a man hastily alighted. He paid his fare and disappeared into the gloom of Limehouse. The mist from the nearby Thames had turned London's Chinatown into a ghostly place. The man hurried along with his hat pulled over his eyes. Now and then he peered over his shoulder, and once he stopped to listen.

He came to Parr Street and turned to the right, passing the shadowy figures of padding Orientals. Soon he reached the dark side entrance of a Chinese merchant's store. Stretching away on the left was the black bulk of a large warehouse. The smell of the river was distinct.

Two minutes later, guided by a stolid Celestial, the man went down a flight of steps into a dim, smoky basement. A room lined with bunks was visible on the right. A withered Chinese sat at a table, loading a long-stemmed pipe. The reek of opium was in the air.

The white man and his guide halted in another basement room. A section of the wall, seemingly integral with it, swung out and disclosed a dark

aperture. The white man stepped through, and the pivoted section closed behind him. As it clicked shut, subdued lights appeared overhead, revealing a curious chamber. It was sparsely furnished in the Chinese manner, with three tall teakwood chairs and a carved desk of the same wood.

In a corner stood a lacquered cabinet. One of the walls was almost covered by a silken tapestry. On the opposite wall was tacked a map of London, with a winding line and several black crosses in the East End section.

As the light went on, a man in Chinese robe was visible back of the desk. A thin scar twisted the upper part of his left cheek, showing dark against the yellow of his skin. His slanting eyes, mere slits as he peered at the newscomer, held a dark inscrutability. But as he recognized the smooth, pink face of the man who stood there, and saw his frightened expression, his Chinese stolidity vanished.

"What is the matter?" he swiftly demanded in German. "Why did you come through Limehouse?"

"I couldn't help it—it was the only way I could dodge pursuit," the other man replied shakily.

"You fool! You've bungled at the last minute!"

"*Nein*, I made no mistake! Somehow, that *verdammte* Yankee learned the truth about me. I came to warn you about him—"

"The Brain-Devil? How much does he know?" rasped the robed man.

"He knows about the blue light trick—that it is not a death-ray," the spy said hoarsely.

The other man's scarred face darkened angrily. He controlled himself with an effort.

"Even so, it will not alter our plans."

"But he has also guessed about the wireless set. He knows we moved it back and forth in a boat!"

The face of the pseudo-Chinaman turned a waxen gray.

"*Mein Gott!* That means he has guessed about the rest!"

"Yes," whispered the younger man fearfully. "And he is getting a raiding-party together! What shall we do?"

The robed German took a swift step to one side of the room.

"We'll strike before they—" he jerked around suddenly. "How do you know that he has learned these things?"

The other man smiled oddly.

"Because, von Krieme, I am Captain Strange."

The German stood as though turned into stone. His slitted eyes went as though magnetized to the gun in Strange's hand.

"*You Teufel!*" He took a stumbling step forward.

"Stand still!" Strange rapped out. "And keep your hands out of those sleeves!"

VON KRIEME'S lips were twisted in a snarl, but he sullenly obeyed. Strange coolly placed the muzzle of his gun against the German's throat. With his free hand he jerked the voluminous folds of silk. A knife fell from a sheath

strapped to the man's right arm. He felt the left arm, prodded von Krieme back against the wall. The German's eyes fixed themselves on the amazing make-up which transformed Strange's face to that of Fowler, the resident spy.

"No," said Strange calmly, "he did not betray you. Your sniper on the roof should have been more careful last night. If he had aimed lower, I would not have thought to estimate the angle of fire. Also, Abrams' last words finally explained themselves to me, when I found that Lee Cheng, importer, was such a close neighbor."

Von Krieme glared at him.

"You are fencing for time!" he spat out viciously.

Strange flicked a quick glance at his wrist-watch without moving the gun from the spy-master's throat.

"Five minutes, *mein Herr*. Perhaps you would like to think of those hundreds you ordered killed last night."

Von Krieme started, and his already pale face became a ghastly color.

"*Gott im Himmel!* You mean to kill me—to shoot me in cold blood!"

"As you killed them," said Strange.

Von Krieme shrank back from the steel at his throat.

"It was a mistake," he cried. "The death-ray was intended only for arsenals and—"

"As I have said," Strange snapped, "there is no death-ray. There were explosives planted under those buildings. One of your men set them off with a wireless relay in the Dornier. The blue flash was from some kind of static machine switched on at the same time. That's why your men dived under that flare—so no one would suspect the buildings were mined as they might if no plane were seen."

Von Krieme stood cowering at Strange's denunciation.

"But it was not intended to kill those people," he moaned. "We did not know—"

"No, you were not sure about your measurements. Before you connected the main cache of explosive, you had to be sure of your bearings. So you dug three lateral shafts. You didn't care what you destroyed, just so you had three points for triangulation—to check your major plan."

"*Grosser Gott!*" whispered the German. "How did you learn this?"

"And," Strange grated out, ignoring the question, "to be absolutely sure no one would suspect the truth, you planted those time-bombs out in Kensington and Chelsea and across the Thames. It was clever manipulation, von Krieme . . . I have even suspected a tunnel dug by coolies from somewhere in Limehouse, but explosions that far off threw me away from the real explanation."

Von Krieme's passion suddenly burst its dykes.

"You devil! I should have seen to killing you myself!"

"As I shall see to you," Strange said grimly.

The cords stood out on the German's yellow-stained neck. Strange eyed the man fixedly.

"An excellent disguise. I wonder

whether you killed the real Lee Cheng—" he shook his head as he caught the quick roll of the German's eyes toward the hidden entrance.

"An old trick, *mein Herr*. I know it cannot be opened from the other side." He looked again at his watch. In five minutes Dreyton's two raiding parties would go into action. If the scheme worked as he intended, von Krieme's Chinese agents would probably make for the secret exit which he knew must lead somewhere under the warehouse. He would force von Krieme to open the pivoted wall-section. In the excitement it should be simple to follow the fleeing Chinese and locate the secret passage. Dreyton's men would do the rest.

He eased the gun's pressure on von Krieme's throat. The German's eyes measured him craftily as he stepped to one side.

Strange waited tensely while the seconds dragged by. A misgiving struck him. This hidden room might be completely sound-proof. He had counted on hearing the alarm. . . .

He stiffened as a muffled buzzer sounded from the direction of the lacquered cabinet. The instrument buzzed three times, with a note of swift insistence.

"What's that?" he snapped.

The pseudo-Chinaman moistened his lips.

"It's the signal from the look-out on the roof."

"Answer him," Strange grated. "And if you're lying—if there's anyone outside that door—" he shoved the gun hard against the German's ribs.

CHAPTER VII

A DEBT PAID IN DEATH

VON KRIEME stepped toward his desk like a man going to the scaffold. He pressed a button, and a panel slid open in the cabinet. A green light was glowing steadily. He opened a drawer, with Strange watching every motion. A Continental one-piece phone became visible. Strange snatched it up from its cradle, held the transmitter end against his chest.

"What dialect?" he whispered.

"Cantonese—"

"Switch him on!"

Von Krieme's stained hand dropped to a row of switches under the edge of his desk. A yellow forefinger, with the long nail of a mandarin, stretched out to a green button. Strange saw it tremble. He shifted the gun to cover the spot where he had entered. If the German had lied . . .

There was a click in the receiver, and a sing-song voice spoke in Cantonese. In the same instant a presentiment of danger flashed over Strange. The pivoted wall-section had not moved. Yet something swept over him . . . it was like a cool wind . . .

He whirled as there came a rush of feet behind him. An enormous Chinaman seemed to spring from nowhere, a gleaming knife raised for a murderous blow. Strange's finger closed on the trigger. The gun thundered in the tight-

closed chamber, and a purplish hole appeared between the Chinaman's eyes.

Three more coolies sprang forward as the first one fell. Strange dropped one, jumped backward to the desk. A dagger shot past his head with a venomous hiss. The blade buried itself in the wall as he threw himself down. His left hand raked over the group of switches. He saw the wall-section swing, but before he could leap toward it a hurtling body struck him from behind. He went down with a crash.

"No, not yet!" he heard von Krieme shout in Chinese. He was dragged to his feet, arms pinioned roughly behind him. At least a dozen Chinamen had swarmed into the room through a second secret doorway behind the lacquered cabinet.

Strange silently cursed himself. He had fallen for a simple trick. As some one exclaimed profanely in German, he turned his head and saw Fowler. Behind the spy were two men in soiled R.N.A.S. uniforms. He knew they must be German agents.

"So that's why you got rid of me?" Fowler snarled. His pink face, which that afternoon had seemed so pleasantly boyish, had hardened into savage lines. He jerked around to von Krieme. "They sent me on a fool's errand. If I hadn't suspected at the last minute—"

"We've no time to talk of that!" the spy-master cut in fiercely. He closed the first hidden panel, gestured for the Chinamen to drag Strange through the other exit. Strange heard him giving swift orders in German to the three agents, but the words were too low for his ears to catch.

Two powerfully-built coolies had him by the arms, and his slightest movement to either side brought instant agony. He stared ahead as the passage widened. His hasty research into the old Roman city and London's lost rivers and creeks had in some measure prepared him for the scene, but realization was none the less startling. They were coming out upon the bank of a dark, narrow stream which wound under the heart of London. This was smaller than the lost Tyburn and Turnmill brooks, undoubtedly. It was, he surmised grimly, a subterranean offshoot of the Walbrook, which had once passed by culverts through the northern wall of the Roman city and beneath the site of the Bank of England. It was, from what he had sketchily learned, similar to the streams that drained the gravel terraces on the south—the Effra, Falconbrook, and the Neckinger, which now flowed underground, still causing trouble at times by flooding basements and undermining roads.

This stream, which was about thirty feet wide except where it neared the Thames, was obviously the one by which the Germans had been able to maneuver under London. A dozen electric lights gave a pale luminance to the eerie scene. Where the creek widened for its hidden junction with the Thames, he saw the barnacle-covered piles which supported the old warehouse. Two of the piles had been removed, the rest being supported by cross-bracing. Just beyond the open space thus created was a huge wooden door, made like a water-

gate. This was connected with a windless at one side.

The water at the base of the gate foamed as it passed underneath, and Strange knew they were close to the spot where Wagner had disappeared. Undoubtedly, the other side of that huge door had been treated to appear like part of the ancient building. The original purpose had probably been to serve Chinese smugglers or earlier river pirates. Von Krieme's acquaintance with Chinamen had evidently led him to the secret, with its diversion to his sinister purpose.

As Strange's captors hustled him along the muddy bank he saw the gray-silver wings of a plane in between the piles. A little shiver went through him as he recognized the Dornier. Moored twenty yards back of it was a "Baby" Supermarine. A motorboat was partly drawn up on the bank of the underground creek. Antennae for a wireless set extended between two masts, at bow and stern. An operator was bent over the receiving set, and lying in the bottom of the boat, bound hand and foot, was Wagner, the missing pilot.

At an order from von Krieme, the coolies shoved Strange toward the boat. He stumbled purposely, bearing the kicks and blows which followed, in the hope that he could delay long enough for what he knew was coming. The Chinamen hauled him to his feet, angrily dragged him on. He shot a desperate glance at the string of lights. There was an extension connection with the boat, apparently a system for charging the batteries . . .

THEY were within twenty feet of the boat when a muffled crash sounded from up in the old warehouse. A whistle shrilled, and there came a rattle of shots. It was the instant for which Strange had waited.

As the startled Chinamen halted, he kicked sidewise at the shins of the man on the right. The Chinaman howled and loosened his grip. Strange tore himself free, swung with all his weight at the jaw of the other coolie. The Chinaman lurched back, slipped on the muddy bank. Before anyone could reach him, Strange leaped for the low-hanging wires. They broke with a brief sputter, and the scene was plunged into darkness. Pandemonium instantly followed.

Above the shouts of the Germans, and the cries of frightened Chinese, another crash came from the warehouse. Strange felt his way toward the boat. The operator was jumping up from his set. They collided fiercely. Strange drove his fist into the German's middle, and the man's hoarse yell died with an agonized gasp.

Mercilessly, Strange drove in another blow. The operator went tumbling down onto his set, but the sound was lost in the general din. Near the water-gate, there was a flash of light. Strange flattened himself in the bottom of the boat, almost on top of Wagner. The pilot gave an exclamation, jerked his head around.

"Fowler!" he cried. "Damn you, you're one of them, too!"

"I'm not Fowler," Strange said hasti-

ly. "This is make-up . . . I'm an Intelligence agent—we figured this out from finding your coat—"

"Then it worked!" Wagner exclaimed. "I made a break, and reached the other end of this creek before they dragged me back."

"I guessed that," Strange said tensely. His fingers were tugging at the Englishman's bonds.

"I tried to get out to the river when I found a connection with a sewer. I couldn't make it, so I threw my coat in, hoping—"

One of the Dornier's engines cut into his words with a roar. Wagner groaned.

"They're getting away! We've got to stop them—"

"I know," Strange said grimly. "They've mined the Bank of England."

The last knot came free. Strange lifted the Englishman to his feet, but Wagner's cramped legs failed him.

"Go ahead!" he groaned. "For God's sake stop them! I don't count."

A rectangle of light loomed suddenly in the blackness of the warehouse floor. A yellow beam probed downward. Dreyton's men had found another connection with the hidden base. Guns spurted redly from a spot along the bank. There was an answering fusillade from the trap in the floor of the warehouse. Five or six coolies went down, screaming. One of the German agents pitched over and rolled into the creek.

Both of the Dornier's engines were thundering now. By the light from the trap, Strange saw Fowler in the pilot's cockpit. Von Krieme was climbing into the rear of the glassed-in turret. The old water-gate was lifting, and under its dripping edge Strange saw out onto the Thames.

Another engine burst into grinding song. The last Boche agent had reached the Supermarine fighter. As the Dornier lurched toward the opening, the machine-gun up in the warehouse cut loose savagely. Von Krieme whirled the Parabellum gun. A scarlet hail lanced up at the hole in the floor. The spotlight there vanished.

Now more lights appeared through the mist out on the river. Strange saw the Supermarine silhouetted against the glow. Panting for breath, he ploughed through the mud for a frantic dive at the wing-tip. A terrified coolie got in his path. He hurled the Chinese aside, caught at the moving ship. The German pilot jumped up as he saw Strange on the wing. His right hand flashed inside his coat.

Strange leaped at him from the wing. The impact drove the German backward over the edge of the cockpit. A horrible cry burst from his lips as his spine cracked under the force. He bent like a cloth dummy and slid down into the water.

Strange barely saved himself from following headlong. He tumbled down into the pit, seized the flopping controls. The single-seater grazed the piles and roared out onto the Thames.

Searchlights were flashing from both sides. Half-blinded by one swerving beam, Strange managed to glimpse the Dornier as it thundered into a take-off.

He kicked the rudder, and the fast little seaplane shot around into the wind. As it ploughed through the water he saw another ship roll down the ramp at the station. Mechanics were rushing a second "Baby" fighter into position.

A tingling horror crept over him as he saw the Dornier lift. A kaleidoscopic picture flashed before his eyes... that switch in the Dornier closing... a gigantic eruption down in the heart of London... men hurled into oblivion... England into ruin.

For no power on earth could stem the wave of chaos if the great Bank of England were lost.

AS the seaplane-fighter rode clear of the water, he pulled up with a fierce disregard for the hardly-warmed Hispano. The Dornier was twisting to follow the course of the river. With shaking hands he set the charging handles of the special twin Vickers guns. There was a prayer on his lips as he clenched the double-trips.

Two fiery lines shot out, lost themselves as fuzzy blurs in a patch of fog. He groaned. The German ship had vanished in the mist. Hisso roaring, he plunged into the steamy mass. The fog dissolved, and three hundred yards ahead he saw the other ship flit past a searchlight beam. Machine-guns on the bank of the Thames were wildly streaking the air. A burst ripped through the edge of his wing. He bored on through, eyes glued to the ship ahead.

The range was too long, but he had no choice. If only he could keep von Krieme from that deadly switch...

A cry of hope rose to his lips. The Dornier had skidded, had lost a hundred feet in the sudden turn. Guns blasting, he closed the gap. Two searchlights whipped their white swaths past him. The glass turret of the Dornier shone like burnished gold under the crossed light beams.

Frantically, Strange aimed his roaring ship toward that shining turret. His tracers leaped through the light, disappeared. A terrific pounding shook the Supermarine. He whipped to one side as von Krieme's bullets gashed the snub nose of the seaplane. The Dornier zoomed, rolled into a hasty turn to escape the tenacious searchlights.

With a flash of wings, another Supermarine drilled up to Strange's level. A hundred feet below, still a third single-seater zoomed to join the pursuit. The first of the two banked sharply, guns flaming. Strange felt a queer thrill surge through him. The pilot was Rob Wagner. With his hair streaming back in the wind, and his set, stark-white face he was like an avenging Fury.

The Dornier, in turning from the searchlights, had come into closer range. As Strange charged in, Wagner struck like a thunderbolt. The Boche ship reversed wildly, and its nose-guns blazed toward the British pilot. Through a break in the sullen fog-clouds, there came a stab of light. Riding up that

beam, blind to all but the Dornier, the third seaplane came streaking.

Strange had to bank swiftly to clear the zooming ship. As his tracers veered off into space, von Krieme whirled his Parabellum upon the newcomer. Only one short burst flamed from the German gun. Black, oily smoke puffed from between the wings of the British ship. As it reeled off, blood-red tongues showed through the black. In a moment there was an inferno.

As the stricken plane plunged down, von Krieme dropped his gun and reached toward the fatal switch. Strange tried madly to bring his Vickers to bear. In a flash, Fowler dived the Dornier. Hammering slugs raked the fighter's thin hull.

Suddenly, above the roar of motors, there came a rising bellow. Von Krieme, his hand on the switch, froze into a statue of horror. Nosed straight down, guns no longer pounding, Wagner was diving straight for the German ship.

Intent on Strange, Fowler saw too late. He threw one hand before his eyes. There was a crash that shook the sky. For an instant Strange saw the smile on Rob Wagner's face...

Moment's later, he realized that no blue flame had spouted up from the City. The Bank of England had been saved. Bob Wagner had saved it... So had Dreyton... So had several hundred Limeys down there...

As for himself, a fellow named Pete Smith still had nine days leave.

Here's the Rearwin Speedster

(Continued from page 28)

from 1/16" sheet. Cover the wings as they are completed and shrink the paper by spraying with water.

The wing stubs shown in three views on Plan No. 5 are cut from soft balsa. These stubs are attached to the sides of the wing stub brace. Use plenty of cement here. When they are dried, attach the wing panels to each side, setting the dihedral and placing small pins through the first wing rib into the stub wing for strengthening. It is best to turn the model over on its back while the wings are drying, placing a small block underneath the fuselage roof so that the weight of the body does not rest on the wings.

LANDING GEAR AND WING STRUTS

THE writer has found that the shock absorbers such as are used on this type of model are the most efficient type that can be used in wheel pants enclosures. Truly, they take the shocks with the greatest of ease, and should the model suddenly dive and smack the ground on its wheels it will rebound into the air continuing with its flight. This is effected by slipping each wheel on a strip of wire cut long enough to form the shock absorber. Then both sides of the wire are bent back and curved a little at the rear of the wheel. Be sure that each wheel rolls straight

and easily on the axle. A good plan is to put little eyelet bearings in the wheel holes on both sides of the wheels so that the constant bumping will not tend to wear down on the balsa or celluloid wheels. A drop of light machine oil will also make for smoother running.

The wheel pants are, as usual, made in halves. Use soft balsa and make perfect streamlines. In the rear end of the pants you will notice that the wood is thickest. Before cementing the halves together, make small slits with the blade of a knife as deep as shown in the top view drawing of the wheel pants on Plan No. 5. The idea is to put the shock absorbing steel wire as far as possible into the rear of the pants. Now apply cement to both sides of the pants halves and plenty into the slits. Slip the wheel into position and push the wire as far as it will go into the slits leaving enough room for wheel clearance. Press the wheel pants parts together and wrap a tight rubber band around them until they have thoroughly dried.

The landing gear struts are made of sheet balsa and laminated cross grain, as illustrated in Plan No. 5. First cement each one of the wheel pants to its respective landing strut, and after they have hardened, cement the landing struts flush against the fuselage sides. Small pins pushed partly into the fuse-

lage through the landing strut will help to hold them into position until the cement has dried.

S-3 and S-4 are the wing lift struts. Cut these to size and streamline them. Four strips are needed—two for each side of the wing. They are cemented at points of the landing gear strut and underneath the fourth wing rib. Use small pins to help hold these in place, removing them after the cement has dried. S-1 and S-2 are braces and are strips of streamlined bamboo. Apply cement generously at the joining parts.

TAIL SURFACES AND PROPELLER

THE tail surfaces are cut from 1/16" thickness balsa. The outlines are 1/8" wide and the ribs 1/16" sq. Two elevator halves are made. After they are covered on both sides, cement them to the sides of the fuselage as shown. The rudder is made in the same manner as the elevator and from the same material. Make a balsa tail wheel, place it on a forked axle as shown on Plan No. 3, and cement to the body. The prop for this model has been found to be the best. Cut out to the shape shown and encase the hub in the spinner cap. Apply the wire shaft in the conventional manner, but slip it through the nose plug eyelet bearing first, before turning up the rear end. Attach the rear hook

to the motor stick which measures $\frac{1}{8}$ " x $\frac{3}{16}$ " x $11\frac{1}{8}$ ".

For motor power, use four loops of $\frac{1}{8}$ " flat rubber. Apply glycerine over the rubber. Attach the "S" hook to one end of the rubber and fasten to the rear hook. Place a drop of light machine oil in between the eyelet bearing and the prop shaft. Remember, of course, to place two or three washers behind the

spinner cap. Glide the model several times. It may be necessary to place a wash-in or wash-out angle at the wing tips, or, turn up or lower the elevators. Use a gear winder to get the most turns out of the rubber. As the model is fast flying and fast landing, choose a wide open space with the least obstruction. As usual, head the model into the wind.

The model in the photographs proved

itself to be an excellent flyer both from hand launching and R. O. G. takeoffs.

If you paint your model, the writer suggests using yellow tissue for the wings and tail surfaces. Paint the fuselage and struts a bright aluminum with red striping along the sides of the fuselage and wheel pants. Other designs may be copied from pictures of cabin jobs.

Happy Landings

(Continued from page 24)

oratory, at Teddington, which will accommodate test models with a theoretical speed of 650 m.p.h.—only some 90 miles short of the speed of sound! Experts maintain that 700 m.p.h. is the ultimate limit on speed, which should be fast enough for any of us of this century.

To clarify this matter and to answer dozens of letters on this subject, we wish to make it clear that these new tunnels do not mean that we already have airplanes that will do 500 or 650 m.p.h. Unfortunately, our newspaper headline writers, in an effort to put the story over, left the impression that the U.S. already had such ships.

ROBOT CRAFT AGAIN

THE news recently leaked out that the British Air Ministry is experimenting with robot planes controlled and operated by radio from a fixed base. This is nothing new. The Germans were running radio-controlled motor boats about the North Sea in 1918. According to supposition, these were to be driven into Allied battleships while carrying heavy explosives.

Robot planes have been under trial in many countries since the war. The United States has experimented with them and has flown and controlled pilot-less ships by this method.

The British, however, seem to have gone a long way with their device. The robot planes can be sent off from the

ground or from catapults aboard cruisers, flown to certain objectives, and brought back for perfect landings.

American Army officials have not seen much value in this device, and one spokesman has declared that no way has yet been discovered whereby the robot plane could actually be guided over an objective for bombing.

To us, this seems like "giving up." If they have perfected the control system to this point, there seems but little else to worry about. After all, they have perfected instrument flying to the point where a ship may be flown to a designated field without the pilot even seeing outside the cockpit. It seems but a short step to complete the job.

There's a lot of smart boys around doing practically nothing. A few hundred in the right place should be able to overcome the difficulty.

THE LIGHT PLANE

WHAT about light planes? And how about the \$700 air flivver?

To us, the light-plane game should be comparable to the outboard-motor craft in the motor-boating field—a clean-spirited sport, based on sane enthusiasm and limited to a reasonable outlay of cash backed with an insatiable desire to fly.

If you can get all worked up about something that does anything up to 100 m.p.h.—with a small, economical power plant turning out anything from

35 to 70 h.p. and offering a high factor of safety—you're our man.

All this, just to get an idea of what is really going on in the minds of our readers. Are you a light plane fan? Would you be interested in joining a small private club whereby you could get flying instruction at a minimum rate plus a certain amount of cooperation with the other club members? Do you already belong to such a club? If so, will you let us know just how your organization is being run? Will you help us establish a real light plane feature where light-plane members can get together through the columns of FLYING ACES?

It can be done. In fact, it has been done in other countries. We are more than willing to devote space and time to the sport, providing we can get a reasonable amount of cooperation from those who are already interested. How about it?

Light plane flying means *work*! Work to raise the money to start. Work to get other members into the spirit of the thing. Work to hold your place as a light plane man, once you have taken your ticket.

And that is only the beginning.

FLYING ACES wants to know your reactions to all this. Drop the editor a line, and in as few words as possible, let him know just what you think about it all. We want keen, serious, constructive ideas—and enthusiasm.

Red-Heads of Death

(Continued from page 13)

will be unable to meet you tomorrow. He's been unavoidably detained. Yes, I believe he has had something special in the way of a paper on legendary animals—you know, griffons and that sort of thing. Yes, you'll have to entertain your friends yourself. Understand?—What's that?"

Warner stopped his pacing and wheeled on his heel.

"Oh, your exercises have been put off a day. Not until Thursday now . . . All the better, it will give you more time to yourself. Call me up sometime tomorrow. That's right—you carry on, yourself."

Schloss hung up with a cat-like smile.

"He was scared, but he said he'll try it. Going to call me in the morning."

"I wonder why the exercises were held over. That's a queer one."

"Don't ask why. It works out swell for—"

They both stiffened, as the hum of an aircraft engine caught their ears. They hurried to the door to see a gleaming Navy ship hurtle out of the blackness for a landing down the long runway.

"Thank God!" gasped Warner. "That must be Jannings. He must have escaped!"

"It certainly is a TG-2, no question about that," agreed Schloss.

As the torpedo bomber ran up, they both started toward it. The pilot got out and unbuckled his chin strap.

"That you, Jannings," demanded Warner gruffly, his hand in his right-

hand coat pocket.

"Sure!" the pilot replied, as he turned to toss something back into the cockpit.

"What happened?" Schloss demanded as he strode up.

"Plenty!" the man answered, still fumbling with something in his cockpit.

"We just called Allbright and told him to carry on. He said the exercises have been put off until Thursday. That wasn't the Griffon, was it?"

"Yes," snapped the man turning around quickly—"It still is."

Warner let out a low growl and tried to pull the gun from his pocket. The man who had dropped from the cockpit of the TG-2 moved like a wraith. Two spurts of silent flame stabbed out of a black something he held in his hand

and there were two dull plops.

In the darkness, it was hard to see just what had happened, but both Schloss and Warner staggered as though they struggled with an invisible ghost. Then with a low gasp, they twisted with painful gestures and fell on their faces.

The man in the Navy uniform strode forward, and bent over his two victims. He felt their pulses and then, satisfied with his work, nonchalantly hoisted Warner over his shoulder and carried him into the hangar shed. In a moment he came back for Schloss. The two inert figures were left stuffed in armchairs while the Navy man made a quick but thorough search of the office.

His long thin fingers went through sheafs of papers in the wire baskets, then he took a list of the telephone numbers from the card near the phone. He tried the knob of the small steel safe and in a few minutes had it open. Again those long hands sifted the contents.

Then the unexpected happened. A voice behind him boomed out:

"Stick 'em up, Mister Griffon!"

THE man in the Navy uniform turned around with a jerk. His face, covered with a strange flying mask fitted with oxygen tube, ear-phones and a muzzle-mike, gave him a weird appearance. His eyes gleamed through the lenses of the helmet and focussed on the small black muzzle of an automatic pistol in the hands of the man known as Warner.

The Navy man raised his hands and glanced at Schloss who still slumped in his chair.

"You made your last mistake, Griffon," Warner gloated. "That stuff stopped me for a minute, but I hung on better than Schloss here. He'll come out in a minute or two. You shouldn't leave guns on tables, you know."

"I see I overestimated the power of that cacodyl isocyanide mixture," the man in the Navy uniform answered. His voice, emerging from a diaphragm fitted under his jaw-bone, was strangely metallic.

"I happen to have the power of voluntary cecession of respiration and did not get the full effect of it," smiled Warner, brandishing the gun again. "Now, what did you do to Jannings?"

"Nothing. He took the easy way out—just as you are going to do."

"Dead?" gasped Warner.

"Dead!" echoed the man called the Griffon.

"Well, it's too bad, but you haven't stopped us," spat Warner. "The job will be completed Thursday. And now it's your turn, Griffon."

"Oh, I expect that. I came prepared for almost anything," the Griffon responded with a strange smile.

"I don't like the idea of killing a man in cold blood," Warner went on, "but under the circumstances and considering what happened to Jannings, what else can I do?"

"The safest thing would be to shoot me as quick as possible, call off your rats, give up your foolhardy plans, and get out of the country."

The statement left Warner puzzled. The jangle of that strange voice was getting on his nerves. The man was actually daring him to kill him.

"We don't scare that easy," Warner remarked, trying to smile. "Besides, we have a ten million dollar proposition involved—probably several such propositions. What do you mean in such a vast undertaking? Just one bullet!"

"Just one bullet," mocked the man in the Navy uniform.

Warner's automatic flamed, and as the gun jerked under the recoil, the man in the Navy uniform spun around and went to the floor. Warner stood with the gun in his hand, undecided as to his next move. Then, as he started forward, a dancing film blinded him. He choked, clutched at his throat, then dropped to the floor.

The man in the Navy uniform arose, placed something on the table, and darted from the room.

THE next morning Mr. Kerry Keen, noted ballistics expert, was hard at work drafting a lecture he was to give before the annual International Police Chiefs Association at Carnegie Hall. He wore a light gray flannel suit. At his elbow stood a tray of breakfast brought in a few minutes before by his chauffeur-butler, Barney O'Dare.

There was the jangle of a doorbell, and a moment later his man announced Mr. Drury Lang, of the Department of Justice.

"Have him come in," said Mr. Keen. But Lang, like a great mastif, was already shouldering his way through the guarded door.

"Cut out the formality," Lang growled. "Get out of here, O'Dare, I want to talk to this bird."

"Ever the gentleman, eh, Lang? Sit down, while I munch this toast. What's on your mind now?"

"Where were you last night?" Lang opened. "The Griffon's on the job again!"

"Me and the Griffon in the same breath again, eh?"

"Come on, no stalling. This is serious. Where were you?"

"Last night? . . . Let's see. Oh yes, we did something, Oh yes. Here's the program." And Keen tossed a small booklet over to Lang.

"Ninth annual exhibition of early Anglo-Saxon tapestry? What the hell does that mean?"

"It means that we—Barney and I—were at the Alderton Galleries. What's up now?"

"I don't like to believe you, you crafty devil, but I'll have to. The Griffon's on the war-path again. This time he's bopping off Navy men and swiping their ships."

Keen raised his eyebrows and whistled.

"I just came down from Portland—flew down—"

"Getting to be quite a dare-devil, aren't you?"

"That ain't all. Two guys in a hangar outside Portland have been found dead from some sort of strangulation—probably gas. And they had neat little cards

on their chests—the Griffon, again. One guy had a gun that had been fired twice. No blood anywhere, though."

"Ghosts don't bother about red and white corpuscles," smiled Keen. "The Griffon is some sort of a ghost you know, Drury."

"Bah!" spat Lang. "He can't go about shooting Navy guys like that. That's one thing he *can't* get away with, Keen. What do you think of this?" And he tossed a slug across the table.

"Here's the gun that fired it—the one we found in the hangar office."

Keen picked it up, carefully examined it, and walked across the room. He drew out a metal box fitted with a sand and steel bullet-stop.

"I'll take a look at this," he explained just before he pulled the trigger.

The gun roared out, the black metal box jerked, and Keen drew out a bullet. He took it back to his desk and placed it in the double bracket of a microscope. Alongside it he placed the slug Lang had first given him. He twirled the knobs for a second or two and peered through the eye-piece. Then he smiled and sat down.

"Well?" asked Lang, who had been examining the program Keen had given him.

"Same gun," replied Keen. "The markings jibe."

"You're crazy! That first bullet was taken out of the brain of Lieutenant Victor J. Jannings who was found in an open field outside Norwich—but that gun was found in a shed more than a hundred miles away."

"I don't care if the gun was found in Kamchatka. That gun fired those two bullets," said Keen, raising his coffee cup.

Lang sat back and wiped his brow with a big handkerchief. He was plainly puzzled.

"But look here, Keen. How could that be. We found out that this Navy pilot was taking a torpedo plane to the new Aircraft Carrier *Rangely*."

"She's off Newport awaiting the North Atlantic maneuvers," added Keen.

"How the devil did you know?" demanded Lang, eyeing his man carefully.

"I read the Army and Navy orders in the *Times*. Simple, isn't it?"

"Well, maybe you do. We'll let that go. Anyway, this kid was found in a field, fully dressed in flying kit, but his ship had been taken, and no one knows where it is."

"Have a gun on him?" asked Keen.

"No. And remember all the Navy pilots carry 'em. Then, almost at the same time, we got a wire from Portland that two men had been found dead in a hangar, and the chief of police up there couldn't figure it out. I flew up, figuring there might be a tie-up—planes and flying fields, you know. But it don't make sense. That gun was beside those two dead guys. I just brought it along to see if you could figure anything out about it—and I suppose you're going to tell me that this Jannings bird committed suicide and then walked up to Portland and dropped his gun in that hangar."

"That would at least be a new one," agreed Keen. "But the solution is your job, not mine."

"Oh, so you're going to quit on me—leave me flat, with a mess like this? Too tough for you this time, eh Keen?"

"What are you getting at?"

"Just this, Keen," snapped Lang, getting up. "You're in a tight hole, and you know it. I'm going to tie something on you yet. You pull soft ones on dumb foreigners and pot-bellied financiers, but when a tough one comes along, you steer clear."

Keen smiled, lit an oval cigarette, and studied his visitor.

"So you still think I'm the Griffon, Lang? Why come to me, then?"

"I don't know what to think. You're a smart guy, Keen, but you're a slacker. You ought to be doing something real. Something for us."

"I've done plenty for you, Lang. Plenty. I don't want to be tied up with routine government work punching time clocks."

"You'll be punching rocks at Leavenworth, if you don't watch your step. You know damn well I *think* you're the Griffon, but I can't prove it. You can prove that you *ain't* by getting the guy who killed this bird Jannings."

"On your story, Lang," Keen reminded him, "Jannings was killed by a gun that was later found beside one of two men also found dead more than one hundred miles away. According to that evidence, the murderer of Jannings has won his reward. He's dead!"

"Yeh, but you know very well that ain't the story at all. It don't make sense. Where's that guy's ship?"

"Now you're talking!" smiled Keen. "Do you want the ship?"

"Sure I want it. The Navy wants it. But I also want to know why Jannings was killed and why that ship was stolen."

"Well, I'd say that if someone stole a torpedo-bomber, he at least figured on doing some torpedo-bombing with it," went on Keen, reflectively.

"Say!" gasped Lang, leaping to his feet. "A guy with a Navy ship of that type could get into places no civilian or foreign plane . . ."

"Now you're thinking, Drury," smiled Keen.

"Hey! You get that guy—somehow. I don't know how, but you got to get him. There's the gun and the slug to work on."

"And what do I get?" Keen asked. "The value of the stolen ship?"

"You get nothing, Keen. You see, you forgot to read this morning's paper. The Alderton Galleries were burned down yesterday afternoon. That program was mailed to you two days ago. You can still see the impression of the cancellation machine where it pressed through the envelope. Now go out and get that guy, or I'll get you. Understand?"

Keen made an heroic effort to check his amazement, but he saw he was in a bad corner. He smiled, lit another cigarette, and began pacing the room.

"You win, Lang, on that point. But you've got to give me about forty-eight

hours, perhaps less. Jannings' death been reported to his ship, yet?"

"Why—no, we were keeping it quiet for a time."

"The North Atlantic maneuvers do not take place until to-morrow, remember, and if what I think might happen is to be pulled, it will most likely be staged somewhere around Newport."

"But how?"

"Don't ask questions. Keep out of my hair until midnight Thursday. Then maybe I'll give you what you want. And keep Jannings' mess quiet, too."

"You'd better, and don't go trying to pull that program gag on me again, Keen. I'm too smart for that one. But I'd give a hundred bucks to know where you were last night."

ACTIVITY aboard the *Rangely* next morning was at high pitch. There were no aircraft topside, but below teams of fitters, riggers, and armament men swarmed over the aircraft stowed in the hold. In the ready-room, pilots, observers, and tactical officers were going over, for the tenth time, the details of their problem which involved the submarine flotilla and two other aircraft carriers, the *Santiago* and the *Concord*.

Captain A. J. Brendol, commander of the *Rangely*, was strangely silent as he stalked the narrow space of his control tower. Maddening things had happened in the past forty-eight hours. Certain equipment from the armament magazine was missing—and worst of all, a new TG-2, which was supposed to have arrived the night before, had failed to turn up. No amount of communication with the mainland or other carriers offered the slightest clue to its whereabouts.

The captain suddenly ceased his pacing, raised a metal sea-phone, and barked into the mouthpiece.

"Hoist torpedo bombers to flight deck at once and prepare for short tactical flight. Send crews to the control tower."

A few minutes later, ten Navy flying men were in the commander's navigation room, standing at attention before Captain Brendol's massive desk.

"Allbright," the commander boomed. "You will have to lead your flight. This man Jannings has not arrived. Our maneuvers will have to be carried out without him. I am sending you aloft for half an hour of formation problem work before the various groups take off. You know the routine involved. We are leaving at once for our position, Point Nine off Nantucket. You will get away at once and return to the deck within thirty minutes. That's all."

"Yes Sir," said Allbright, a swarthy man in greasy leather. "Then I am to be in charge of this flight?"

"Fully. Let's see, you have Cudmore, Whelan, Offing, and Scheer under you. If Jannings arrives in the meantime, I'll send him on to take No. 6 position and you can carry on for an extra fifteen minutes."

"Yes, Sir!" snapped Allbright. The men saluted and left the cabin. As they clumped down the metal companionway toward the flight deck, Allbright turned to his mates, and from behind his

cupped hand chortled: "What a break!"

The *Rangely* crouched up her anchor chains and got under way. On the flight deck, the TG-2's were being blocked in and the motors opened. The aviation armorers were fitting and checking the guns. The *Rangely*, already picking up speed from the G. E. turbines that turned out 180,000 S.H.P., was now nosing around into the wind.

The Great Lakes torpedo-bombers were carrying Whitehead torpedoes and each carried only one gunner. This man occupied the front pit from where he could handle the sighting and release gear. The gunner-radio man who normally occupied the rear pit had to be dispensed with.

Allbright stood in the shadow of his wing with the other pilots and front-pit men around him.

"Okay, boys," he beamed aloud. "Let's go. We'll cut back inland a bit first. But if you see another TG-2 in the air—it don't belong. Get it? You know what to do."

The last few sentences were given in a discreet whisper.

They climbed in. The deck mechanics steadied the leader's plane and held her while he opened up and got the flash from the control tower. Down the white line he roared, skimming into the air a few yards past the tower. He circled while the four remaining TG-2's followed in nautical order.

Above the aircraft carrier they formed, and Allbright's ship took the lead as they fell out behind him and climbed for height.

It was reasonably early in the morning when Lieutenant Allbright led his pack of high-explosive carriers toward the mainland. But there was no evidence of any tactical flying once they were clear of the big carrier. Rather, they huddled together like skulking pirate craft awaiting a victim. Had it been possible to peer into those four cockpits, one would have been astonished by the faces of these men. Somehow, they did not reflect the keen enthusiastic features of Navy men intent on perfecting a maneuver or thrilled by the joy of service flight. They had small beady eyes, course faces. They watched their front men anxiously, half-untrusting. Their expressions were grim.

IT was Allbright who saw the sixth TG-2 come thundering out of the west, minus a torpedo. It was the cold-eyed Allbright who gave his front man the signal to warn the others. And it was Allbright who nodded when his gunner tapped the movable Browning on the frame around him.

They crept in closer, wing-tip to wing-tip, and maneuvered skillfully to block off the newcomer. Allbright gave a signal and the two rear ships of the Vee climbed suddenly and hurtled on. The newcomer came on, trim-winged and jaunty. The outline of the coast lay off in the morning mist, an indistinct blur of gray and dull green.

"Let him have it!" barked Allbright. "Don't take any chances on him faking it."

Allbright's gunner opened the show.

His gun began to dance, its quivers vibrating along the longerons. Allbright kept straight on and blocked the other TG-2 off. From above, the two climbers now dived down like winged hell and directed a converging stream of fire on their victim. For what seemed minutes this mad drama went on, the unfortunate devil in the lone TG-2 trying to squirm out. For he was helpless with no armament in the front seat. He darted, dived, and wheeled on his ailerons, but no matter where he turned, there was always a spitting TG-2 to block his path.

"He can fly, whoever he is," growled Allbright. "Whelan had him cold then, but he actually slammed her up on her back and half-rolled. That baby *can* fly!"

The unknown in the sixth TG-2 came at Allbright with every ounce of power. Allbright's gunner saw him and ducked. Allbright sensed that he was being out-gamed and screamed at his front man, but his gunner was thinking of two things—being crashed head-on, or taking to the silk before anything else happened.

Allbright drew a gun and rapped the top of his cowling with it.

"You pull out now, Snyder," he screamed, "and I'll blow you out of this ship, cold pork!"

Whelan nosed down on the newcomer and poured a long burst into him, but the strange fang-less TG-2 cleared with a display of beautiful flying. As he turned and whipped over, Whelan's TG-2 suddenly disintegrated in mid-air. A low but thunderous boom echoed out and a blanket of smoke and flame blossomed from somewhere behind the pilot's seat.

"What the hell?" roared Allbright. "What happened to him—" Then suddenly he gasped—"The Griffon!"

A black ship with a strange silver insignia was dead behind Whelan's doomed craft. From its nose spat strange, liverish spurts of flame. A wing tip ripped away from the TG-2 and fluttered off like a released box-kite. There was another roar, and a wing-tank went up, sending out a spluttering wall of shapeless flame as the strange black seaplane zoomed up and cleared.

Allbright tried to get around to give his gunner a shot, but the front man was staring wide-eyed at the newcomer. Over came the black ship, and then from a recess in the port pontoon surged another elongated cone of death. Allbright's ship staggered under the pounding, but he managed to get it clear and his gunner came to life to answer the fire.

Meanwhile, the other two TG-2's flown by Cudmore and Scheer slammed down on the black seaplane and tried to hook it with long bursts of Browning. The black ship whipped up, zoomed like mad, fell off in an Immelmann and came back at Scheer—only to pull out again when Allbright's gunner drove a wicked belt at him from below. The black ship stood on her tail, nosed up like a falcon, spewed a blinding smoke-curtain out of a jet fitted under her belly—and raced away.

"Where the hell—" gasped Allbright. "Where's that other guy?"

The lone TG-2 was now nowhere to be seen and the black devil was high above them, streaking for the ceiling like a great black thunder cloud. Allbright knew there was no chance of getting up there after him with the 1,000-pound torpedo he was carrying.

He ordered a re-form and led his four-ship flight away toward the northwest. He was perspiring, quaking and white. His hands trembled on his control stick. The Griffon had struck again!

At sea, the *Rangely* raced out to her contact point off Nantucket. From her racing prow streamed two milk-white surges of cloven water. Captain Brendol was listening to a report of gunfire which had been picked up by his microphone men. He was unable to understand it all. The whole situation was getting worse.

He dismissed his Gunnery Officer and turned back to his tactical problem chart. Then the "Alert" siren screamed out from the flight deck. He arose ponderously and peered out of his chart room. A lone TG-2 was screaming out above the stub mast and the Landing Officer was barking a series of orders from the wing-bridge that looked down over the long deck. Two "asbestos joes" in their white, fire-proof suits came out of the companionway carrying fire-foam tanks, monstrous metal-cutters and hatchets. The landing crew took up its position in the shadow of the control tower, and the Landing Officer went below and stood at his post, hands outstretched to signal the landing orders.

The TG-2 curled around and awaited the jet of steam from the deck which would indicate the true wind-direction. The *Rangely* headed around until the steam plume swept back parallel with the long white line that bisected the deck.

Then the TG-2 came in, handled beautifully, dropped her wheels at the direction of the Landing officer, took up the secret arresting gear, rolled to a jerky stop in the shadow of the control tower.

Mechanics who ran out to steady her wing-tips saw the pilot speak into a helmet muzzle-mike before he released his safety-belt or shut off his motor.

"The Captain's compliments, Sir; and will you report at once to the bridge?" a young C.P.O. said, climbing upon the step, and barking into the Navy pilot's ears. "And you'd better have a good story ready, Sir," he added. "The Skipper's on the gristle."

"Okay, Spit and Polish," grinned the pilot. "I'm just a youngster trying to get along. But get this boiler refueled. I have an idea he will want me off the deck again pretty quick."

"We take orders from the Flight Officer, Sir," snorted the C.P.O.

"Don't worry. You'll get 'em—Plenty."

And with that, the young Navy pilot clambered out, loosened most of his flying kit, and thumped off toward the control tower. He made his way up the companionway and with a jaunty stride,

approached the Captain's quarters, knocked with vigor, and stalked in.

"Lieutenant Victor Jannings, Sir. Reporting for duty aboard the aircraft carrier. Unavoidably delayed *en route* last night."

Captain Brendol took the proffered papers and glanced through them before answering. Then he sat back and inspected his new pilot.

"What happened?" he snapped.

"Fired on by unknown pilot and disabled. Landed with the aid of flares in a field about twenty miles west of Poughkeepsie, too far off a highway to make any connections. A fishing party gave me a hand and shelter for the night, and I repaired the damage to my main feed line with a length of steel fishing rod. Not a bad job either, Sir."

The Skipper eyed the Navy pilot carefully.

"Who fired on you?—What sort of ship?"

A black seaplane with amphibian equipment. Fast as hell, Sir, and carrying enough armament to stop a cruiser. Had the lines of a British machine, one of the Fairey types, but carried no marking on the side except a queer-looking silver dragon—one of those legendary gargoyle things, you know."

"It didn't look like a griffon, did it?" asked Brendol, in a low tone.

"Griffon, Sir. What's a griffon?"

"Never mind. Come clean and tell me what happened out there this morning—just now. Our tin-ears picked up machine-gun fire."

"They ought to. He jumped me again."

"Who? The Griffon?" gasped Brendol.

"The same guy in the black ship," said the Navy pilot. "I charged him though and he cleared off and hid in a smoke screen he blew out."

"God Almighty!" Captain Brendol gasped. "Did you see a formation of TG's out there?"

"No. Is my mob aloft?" The young pilot looked anxious.

"Look here, Jannings. Sit down," ordered the Skipper, picking up a massive pipe. "There's something queer going on aboard this craft. You're a new man aboard and I'm going to confide in you. Perhaps you will see things that have escaped us."

The man known as Jannings sat down, with a puzzled look.

"You're supposed to be one of the best men they have turned out of Pensacola in years, and we can use you here. I was figuring on having you lead the torpedo-bomber flight in the problem tactics, and you might as well know what has happened so far."

"Anything wrong, Sir?"

"Plenty! For the past few weeks, the TG-2 flight under Lieutenant Allbright, has been giving us plenty of trouble. They are all good men, as pilots go, but they have not been playing the game, as we know it. Too many forced landings and failures to turn up on time in routine maneuvers after leaving the flight deck. They have been missing for as long as two hours in some cases, and with no particular, or reasonable, explanation. They all seem well healed for money and we have been wondering

what game they are up to. There's plenty of chances for men in their position to do under-handed work—smuggling, dope-running—but so far we've not been able to hang anything on them."

"Checked their tail-skids for evidence of landings anywhere but a flight deck? Dirt, grass, or sand?"

"No—no, don't think anyone has. Not a bad idea, though."

"When are they due back?"

"In about five minutes. They went off to give Allbright a chance to get in a little flight-leading experience. Fist signals and all that, you know. But here's something that has us worried."

"Wait a minute: Will you order my ship refuelled and made ready for a quick take-off. I have an idea."

Captain Brendol picked up a phone and punched a button. Then he gave orders for the refuelling of the new TG-2.

THE Skipper's face was an ashen study when he had completed his orders. He glanced at the Navy pilot and suddenly barked:

"What would you say, Jannings, if I told you that six live heads for our torpedoes had been stolen from the magazine?"

"Live heads?" gasped the young pilot. "You mean red heads?"

"Red heads," nodded Brendol. "The real thing. Not maneuver equipment. Live heads for 1,000-pound White-heads."

"Well, they certainly wouldn't take them to decorate a summer porch with. Looks like someone wanted to do some torpedoing."

"That's what I think," agreed Brendol anxiously. "You can only use them on Whiteheads and the only thing that sounds reasonable is that they are to be used—for something."

"What was this guy Allbright and his flight carrying? Reds or grays?"

"Just grays—practice heads. We don't fit reds, even in tactical maneuvers."

The Navy pilot looked up at the chronometer fitted into the wall and leaped to his feet. He started to clamber back into his harness and tighten his chin-strap.

"What's the idea?" demanded Brendol.

"Look at the time. Your torpedo flight should be back by now—but they're not. I'm going out to find out why. With your permission, of course, Sir."

"O.K. I'll get you a gunner."

"Never mind. I want all the speed I can get. Leave it to me. I might even want the space, too, later."

"But you can't take care of yourself from that cockpit."

"Leave it to me, Sir. I have an idea."

"You got everyone beat on this tub, if you have. Go ahead. White card."

The flight deck of the *Rangely* was cleared for action again and the TG-2 was drawn back as far as possible for the take-off. The young Navy pilot climbed in, checked everything quickly, and got a flight log report to sign from the squat C.P.O. Then he opened the Cyclone and awaited the flash from the

control tower.

The carrier swung into the wind and the TG-2 roared down the swaying deck. Once clear of the control tower, the young pilot hoiked her off, curled over, and then settled down for a stiff climb.

Below him lay the impressive gathering of the sea clans. The three big aircraft carriers, a double row of darting destroyers with impudent snouts burrowing into the swells, and the long line of Barracuda type subs all moving out for Point Nine of the tactical problem map. Grim faced commanders paced their bridges. Gunnery officers were at their posts in the fire-control towers. Radio men sat tense over their sets, and greasy engineer officers stood by their telegraph control boards. There was a strange, spine-tingling current of expectancy throughout the flotilla.

Aboard the aircraft carriers, the mechanics were trundling the fighting planes to the "T"-shaped lifts and great chains clanked and rolled over massive pulleys. Already, the single-seater fighters were on top ready for the signal to get away. Behind them were placed the two-seater Navy observation jobs, and the heavier bomb-carriers squatted at the stern.

High speed coastal motor boats darted along like stormy petrels carrying life-saving equipment in case of engine failure on take-offs. They were manned by pink-cheeked midshipmen assisted by stern C.P.O.'s. The safety nets were up along the edge of the flight decks, and the drag-net was ready aft for trailing when the war birds came back to their Navy roost.

The lone TG-2 climbed and headed for the wafting plumes of light clouds that hung over the water between Nantucket and the mainland. Then, when the needle showed 6,000 feet, the young Navy pilot turned and twisted the dial of his two-way set.

"Calling O'Dare!—Calling O'Dare," he spoke into the muzzlemike. "No. 1 calling O'Dare!" He held the TG-2 in her climb and glanced back again to make certain he was using the secret wave length they had agreed upon. In a moment he got a reply:

"Okay, No. 1, O'Dare answering. Where are you?"

"Six thousand feet above surface, fleet heading out to sea. Where are you?"

"Back west of Portland. Come on through. Four ship made landings near here and have stored planes away out of sight. I'll wait for you at 10,000."

"Okay. Red and white light."

IT was two hours later that a strange black seaplane contacted a TG-2 over Portland. They exchanged light signals, then the torpedo-bomber swung in behind the black ship and the two raced off to the west. Fifteen minutes later after a cryptic radio conversation they shut off their motors and settled down into an easy glide.

Below them lay the rangy woodland of western Maine. Sebago Lake gleamed off to their right, and ahead sprawled the rolling hills of Old Spec and the lake regions around Waterford. Here, were wide areas where few humans

might be found even in the busiest of vacation seasons, and it was here that Lieutenant Allbright had brought his four renegade TG-2's for safety—and refuelling.

The ships had been landed down the long side of a rough and rolling hillside that rolled away from the disused shaft and buildings of an old tourmaline mine. The ships had been taxied up to the old sorting shed where sufficient cover was available. Then the crews got out and crowded around Allbright.

"All right, you birds. Get to work and change those heads. I'll try to contact either Schloss or Warner. We get our dough before we go any further."

"What about that guy Jannings. That was Jannings up there, wasn't it?" demanded Cudmore.

"Say! You got me, Cuddy. Something queer in all that. They told me Jannings would not be here. I was taking no chances on him, either. Besides, with him out the split is bigger. Whelan and Moore out too."

"There's something screwy about this, Allbright," barked Offing. "That black ship with that dizzy insignia on it. That guy's poison to us. He's hep to our game, I think."

"So what? He can't stop us now. All we got to do is to get off as soon as it's dark and pick off the *Rangely*, the *Santiago*, and the *Concord*. We sink 'em and Schloss and Warner sell the government those liners that are eating their heads off in dock—and we split a quarter of a million. What could be sweeter? All we have to do then is to split up and get over the border. Then we'll be sitting on top of the world."

"Yeh, but that guy in the black ship. He gets in my hair."

"He can get into my back teeth, if I get my split of a quarter of a million," growled Allbright. "As for me, I'm hiking into Rumford Point to contact Warner and Schloss—by phone, if possible."

"Yeh? Well, we're all going along, too. You don't pull that gag on us, Allbright," growled Offing.

"What, and leave the ships here, unguarded?"

"Sure. Why not?"

"You're crazy, but if you want to take the risk, it's okay with me. These hicks up here won't touch government property, anyhow. All right, let's get those soft noses off and put on the reds."

Grumbling, they returned to their ships, pulling off their flying tops as they went. Then the gray-painted practice heads were removed and deadly war-heads, painted a brilliant scarlet, were hoisted and screwed into place. This change turned the massive White-heads into murderous projectiles capable of blasting a huge hole in the side of a vessel—particularly when guided by bomb-sighters who knew every inch of armor plating aboard their unsuspecting targets. One torpedo was capable of sinking a 15,000 ton vessel of the *Rangely* type.

Three would account for the *Rangely*, the *Santiago*, and the *Concord*, with an extra for any emergency or a possible miss. But Lieutenant Allbright had planned that there should be no misses. The fourth was intended for the possi-

bility of an accompanying first line battleship which might be able to offer blanketing anti-aircraft defense.

Lieutenant Allbright was smart—cruelly smart, and he was playing for a big stake.

But the rest were taking no chances on him now. Too many queer twists had come up. It was all right while they were getting the stolen war heads out of the magazine and hiding them away in this wooded retreat. They had been able to talk their way out of that, but this Jannings business, the mysterious TG-2, and the black seaplane had them worried. Besides, the pilot of that TG-2 had probably reported to the commander of the *Rangely* that he had been fired on by five TG-2's of the aircraft carrier squadrons. But they had to go through with it now. And they were going to see that Allbright was not pulling a fast one on them by getting the money first and then skipping. There was plenty of risk in leaving the ships there; but there was a greater one in letting Allbright go alone to Rumford Point. Had they known that both Schloss and Warner were dead, this story would never have been written.

The work on the torpedoes done, the men stowed their flying equipment and gathered in front of the old mine sheds.

"It's a lucky thing Navy pilots don't go in for haberdashery," growled Allbright when they were ready. "We look like disreputable jungle jumpers."

It was true. All wore dirty khaki or denim slacks. They would have passed for a harvester gang. Together they clumped away along a trail running through the woods toward the third-class road that ran into Rumford Point.

BY noon, the straggling group of Navy pilots wandered into the old Maine town and approached a large old building that housed a telegraph office, a drug store, and a massive hardware store that catered to everyone from farmers to vacationers. While Allbright sent a telegram, the rest scattered about the main street, purchased newspapers and refreshments, and listened to store-front loud-speakers.

Then in twos and threes they sauntered down the street through the groups of guides, campers and hikers that made up the summer population and headed for the Post Office. Here, Allbright had a private box under an assumed name. He went in and peered into the small glass window, but it was empty.

He came out frowning.

"Nothing doing yet," he announced. "We'll have to hang around here for an hour or so until we get an answer from Schloss."

"I'll bet a buck something has slipped," growled the dissatisfied Offing. "I got a hunch they pulled out and are leaving us to hold the bag."

"Well, it's either hold the bag or grab a quarter of a million," replied Allbright. "We've gone this far, and there's no way out of it. If we nail those carriers, Schloss and Warner will sell their liners. No matter what happens after that, we can't lose. They'll have to pay

up—or we squawk."

They all agreed that much was certain.

"Okay," agreed Offing. "Let's split up a bit. Cudmore and I will stay with you, Allbright. The rest can mosey around the main stem here in twos and threes and keep their eyes open for a signal to get back."

"Right. Step around and pick out some lunch rooms and pack plenty. You'll need all you can get inside you, once we get under way. God knows when you'll get another meal."

They nodded quietly and wandered off as agreed. Allbright, Offing and Cudmore sauntered back toward the Western Union office.

As they approached the general hardware store, Offing frowned as he saw two men walk out of the wide doors, cross the old piazza front, and go up the street in the opposite direction.

"Hey!" he husked. "Who are those guys? They don't look like natives—or vacationers."

"Shut up. You're getting jittery. You got to keep calm now, Offing," warned Allbright.

The two men in question were of normal height and build. One walked with a jaunty step in a pair of well-cut hiking boots. He wore gabardine riding breeches and heavy golf stockings. The other slouched in an easy movement as he walked. He was wearing an old cap, a one-piece overall and carried a long package.

The three Navy men watched them from the steps of the store. Then Offing growled.

"I'm going to satisfy myself about those two guys. Be out in a minute."

They waited for several minutes, then finally he re-joined them.

"It's all right, I guess. The bird inside said they were a couple of New Yorkers on a fishing trip. They had a crack-up with a canoe and bought some canvas, glue and paint to repair it. Just wanted to make certain, though."

HAD Allbright and his mob been wise enough to follow the two New Yorkers, they would have discovered that once clear of the town, they cut across an open field and headed into the woods until they reached the footpath leading to the old mine.

Moving fast, yet quietly, they soon came out into the mine clearing. From a sheltered thicket they studied the layout carefully, then boldly walked into the old sheds. With all the curiosity of a couple of laymen they wandered around the sheltered ships and inspected them in the manner of those who have never been in close contact with aircraft.

But once satisfied that there was no one guarding the ships, they darted to the front of each plane and began to work on something between the under-carriage legs. They unrolled the brown paper package and divided the contents. Then silently each labored for nearly half an hour.

They had entered with one large package, but left with four. Each carried two as they hurried across the open space and disappeared into the woods.

At 5:30 that night, Allbright received a strange message from Newport signed by a Professor Schloss. It read: "Complete detail. See you in Montreal tomorrow night."

The message had been filed at 5:15 by a young officer wearing a Navy uniform. By the time Allbright was reading it, the young Navy officer was hurtling back toward Rumford Point in a Navy TG-2 which he had left at the Navy airport outside the submarine base.

"Okay, boys," beamed Allbright, showing the telegram to his men. "Tonight's the night. We get our dough tomorrow in Montreal. Let's go!"

A signal was flashed to the others and all eventually joined in the path through the woods to hurry on in Indian file toward their secret lair.

It was getting dark by the time they were back. They hurried into their flying togs, crawled into their parachute harnesses, and wound their inertia starters.

"All right, boys," said Allbright as he tightened his belt. "Remember now. Get to 4,000 over Portland. I'll take the lead from there. The carriers will be bunched for the night-maneuvers off the tactical problem point No. 9. I take the *Rangely*, you, Cudmore, the *Santiago*, Offing gets the *Concord*, and Scheer follows me and picks off the *Pennsylvania* if she is in close enough to give us any anti-aircraft trouble. Is that all clear?"

"You are not figuring on any trouble from that black guy?" asked Offing.

"Oh, forget him—why should we? But watch out for that other TG-2 and don't get mixed up. If he appears, you can tell him easily. If he carries a torpedo it'll have a gray nose. We've got red-heads. Remember that."

He grinned across at the row of scarlet noses that gleamed from the snouts of the big Whiteheads.

Together they kicked their inertia starters and the big Cyclones boomed. They ran them up, allowed them to warm, then Allbright roared across to the rest: "When you clear, follow me. I'll show you the way to the field outside Three Rivers where we can fire these boilers and get a train through to Montreal. We can be there by early morning. Let 'er go!"

One by one, they raced away into the gloom of the night. The woods seemed to tremble along their fringes as the high-powered motors opened up and the heavy torpedo-carrying craft swept up into the night.

They cleared the first belt of pines and flew past another open space where, had they circled and observed, they would have seen strange activity below—lights and the movement of two men in a sheltered grove where two other planes were hidden.

Allbright led the way, climbing with every ounce of power as he followed the Grand Trunk system down toward Lake Sebago. Once they reached Portland they had plenty of footage. Here, they gathered in battle formation and settled down for the rush to the point south-east of Nantucket where three aircraft

carriers lay at anchor, unmindful of the fate that faced them.

On the carriers, decks were cleared and all fighting craft were below undergoing routine inspection and repairs following the first day of problem operations. Pilots, gunners, and radio men were stretched on their bunks, utterly exhausted after long hours of high pressure activity, where tight formation work had been the order of the day.

Captain Brendol had inspected his pilots and crew and was satisfied that they had had a full day, but he was more worried about one man. He had 169 officers and 1,730 men under his command, but like the Shepherd was more concerned about the one who was missing.

"Six TG-2s missing in one day," he snorted to his Flag officer. "No trace of them since they left the deck. And this is only routine practice. In the war, we knew whom we were fighting. But who are we fighting here? I could stomach this business of Allbright and the others. They'll turn up. But it's this young fellow Jannings that has me worried."

"Seemed like a cool one, Sir. Ought to know what it's all about."

"That's right, he does. But it might get him into trouble. And that black devil, too. Why can't we get our hooks on him? If Jannings is in trouble, you can bet your last pair of socks that it's that black swine."

"I can't understand why you put so much trust in Jannings, Sir," the Flag Officer went on. "You had never seen him before—only his papers."

"Papers be damned. They can do anything with papers. I like the cut of that man's jib. He can be trusted. He'll find out what the devil Allbright and his tribe are up to."

"But why hasn't he turned up—or reported? He landed at Newport this afternoon. Showed his white card, refueled, and cleared off again without saying anything to the Station Officer."

"That's why I gave him a white card. He'll turn up—Hello! Here they come now. Listen!"

THE drone of motors came out across the water. The Landing Officer outside barked orders for flood-lights and in three minutes the *Rangely* was bathed in a steely glow that brought out the complete details of her flight deck. Captain Brendol hurried to the outside bridge wing and stared up. A searchlight stabbed out and swung across the sky. It caught four TG-2's as they came down in a long whining glide from the sky above.

"Allbright!" gasped Brendol. Where the devil have they been this time?"

"But look, Sir—Look!—Their tubes—They're carrying red-heads!"

A siren screeched out, more lights went on, and out of the sky above came the roar of two more motors.

Brendol gasped. He flicked out his binoculars, flipped on the nightglass filters, and stared up. He staggered back, stunned.

The scarlet noses of the Whitheads slung in the crutch-racks under the

TG-2s caught his eye at once.

"That's—that's where those war-heads went. Good God! They're going to torpedo us! See, they're splitting up to get the others. Break out those anti-aircraft guns! My God! No men at the emergency stations—"

The leading TG-2 came down headed for a broadside attack on the *Rangely*. They saw the long grey tube shoot out of the crutch and nose down for the water. It struck, threw out a plume of spray, and raced through the water toward the hull. Brendol never saw what actually happened, he was barking orders into the wall-phone.

There was a dull thud. Then directly above, a TG-2 exploded in mid-air and threw its vitals in all directions. A wing scrawched and fluttered away. A ghastly design of flame and smoke was bashed against the night sky. And an ebony, devilish something charged through with three guns pounding.

"That black devil again!" half-screamed Brendol. "He got that TG-2."

"Who the devil?—The torpedo did not explode. Look! It's floating off there."

"How the hell—It had a war head on!"

But the mad carnage was still on. Searchlights swept back and forth. Guns crackled and pounded into the night. The other TG-2's had broken up and were fanging down at the other aircraft-carriers that lay at anchor near-by.

But once they nosed down to discharge their torpedoes, they fell under the terrible fire of the black seaplane. The pilot was taking orders from a TG-2 that followed him like a wraith. Offing, nosing down for the *Concord*, never knew what hit him. He was so intent on getting a true bead on the bulging sides of the *Concord* that he did not see the black wraith slam down upon him.

The flame and crashing hail caught him full as he jerked his torpedo release lever. He did not live to see his tube slash through the inky water and bash up against the safety-bulge to stop with a low plop. The TG-2 jerked under a dead man's choking grasp and screamed up into a retching stall. The black raider slashed in and delivered the *coup de grace* with a terrific smash into her tanks from his heavy Vickers guns and the second torpedo plane disintegrated and tore herself apart like a mad firework display.

Captain Brendol stood on his stub bridge, his great jaw hanging like the mow-gate of a barn. It was impossible—but it was happening. The TG-2's were attacking with war-heads, but nothing was happening. The torpedoes were hitting the bulges, but their scarlet snouts were giving way and the 1,000-pounders were floating off for retrieving, just as they did in maneuvers. It was impossible with war-heads, but here it was—and a black demon was skimming all over the sky, smashing the renegade ships to bits.

A few chainlengths ahead lay the *Santiago*. Her decks were ablaze with

lights. Anti-aircraft men were swarming around the port and starboard 25 cal. weapons. Already one gun had been broken out and the gunners were slamming shells into the breach.

Pung! Pung! Pung!

Cudmore, sobbing in his tense fear, was working through the smoke and searchlight beams, but wherever he moved that damned torpedo-less TG-2 blocked him off. He was screaming his hate while his gunner tried to break through on wild bursts. Cudmore had no time to figure how a quarter of a million would split now that he had seen Allbright go down and Offing get it over the *Concord*. But there was still a chance if Scheer would get one of the two. He would take care of the *Santiago*.

There it was now, directly ahead. And there was plenty of headache coming from the flaming snouts of the five-inchers below.

It was neck or nothing now. He nosed down, eased back on the throttle, and set his dive-sight on the broad control tower of the *Santiago* and raced on. His hand reached for the release toggle, his eyes were glued to the sight. The TG-2 roared at her massive target—and Cudmore knew no more.

A battering blanket of fire had swept down on him from above. He slumped in his seat and shoved the stick under the instrument board. The TG-2 hit full-tilt into the water twenty yards from the hull of the *Santiago*. The tail came up, the nose seemed to struggle in the water, then she settled suddenly and jerked her gleaming colors as the rudder went down.

The black ship curled over, almost dipping a wing-tip in the rollers. It came around with a TG-2 on its tail and slammed up with a roar through the mad curtain of smoke and blinding arc-lights to pour another terrifying burst into a torpedo-bomber that was making a frantic effort to clear and get away.

Scheer and his gunner were on their way to Three Rivers—and Montreal. He tried to get rid of his heavy torpedo, but his frantic fingers would not release the toggle. He struggled and fought with it until it was too late.

Unbridled hell came up from below. The TG-2 shivered from prop to nose and fluttered under a bitter lead storm. Scheer tried to get his nose down and dive, but his controls refused to answer his call. He screamed something to his gunner and tried again, fighting with everything in the cockpit. The gunner hung over his mounting like a scarecrow that had been caught in a tornado.

Brat-a-tat-tat-tat!

Again that ghostly black devil with the silver insignia on his fuselage slammed in. His rotator gun vomited lead in an enveloping storm. The TG-2 wavered under the battering, struggled to keep in the air, and then gave up the ghost. A wing slipped back and fouled the tail surfaces. A low boom like of thunder belched out, and tinged with scarlet flame she dropped into a slow, fiery spin.

The Griffon had struck again!

THE sky above the anchored fleet was now an aerial madhouse. Guns still barked at the two remaining ships that coursed through the smoke-streaked skies. Great lights flashed back and forth like gigantic sword blades handled by monstrous giants. They seemed to be trying to cut the two planes down with the strength of their fury.

Captain Brendol stood on his bridge surveying the insanity, unable to make it out. All he knew was that somehow his aircraft-carrier flotilla had been saved in spite of the fact that his own TG-2's had attacked with war-heads. He had seen them hit and register on the bulges. He had seen a black ship batter the treacherous TG-2 pilots out of the sky. He had seen another TG-2 following the black ship as though it had been wired to it. But none of it made sense.

Then the most amazing thing happened.

They were preparing to lower a coastal motor boat to retrieve the floating torpedoes and if possible, rescue any members of the torpedo carriers, though they realized this was hopeless. The ack-ack guns had been silenced, and only the searchlight crews were still at their posts, pouring their blinding light on the skimming planes that were now curling down through the blinding smoke that still streaked across the battle-torn skies.

"Good Lord, look here!" gasped the Flag Officer. "The TG-2 is making a landing on a still deck. He'll kill himself!"

"Landing party on deck!" screamed Brendol. "Emergency party to its post!"

The TG-2 was curling in skillfully. Again floodlights bathed the deck, and the Landing Officer ran to his post with his guide batons tipped with small electric lights. He stretched out his arms to assist the pilot in getting the TG-2 in and watched amazed as the pilot did a mad falling-leaf until his nose was below the stern lip of the landing platform. Then the Cyclone went on with a short jerk and the TG-2 came up over the lip like a winged monster, choked her motor and killed her forward speed with a wild fish-tail maneuver. The wheels dropped into the arresting gear and the craft rolled to a stop.

The deck crew stood petrified for several seconds at the daring of this maneuver. Then to a man they raced toward the swaying machine. The pilot stood up in his cockpit, threw a saucy salute to the bridge, and vaulted over the edge. He was dressed in a tight-fitting cover-all—and his face was shielded in a bright scarlet mask.

Then, before anyone could stop him, he raced to the side of the deck and with another wave to the bridge, took a beautiful header over the side to the water sixty feet below.

"Stop that man!" screamed Captain Brendol. "I want that man!"

But the deck crew was helpless. All they saw after that was the black seaplane coming down to the water, its wings almost scraping the sides of the hull. It dropped with a surge of spray a few feet from where the man in the mask had disappeared.

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official magazine. Another commendable plank called for support of its advertisers.

When it came to buying model kits, everything was fine. They found a wide variety from which to choose. But when in need of sports wear, Bob found our pages as barren of such advertisements as were the Western plains of grass last summer. To make a long story short, Bob wrote us quite a frank letter, stating that he could not understand why a magazine of our type was so totally devoid of such advertisements; in fact, he asked: "Are you turning down manufacturers of sports wear?"

F.A.C.'s, it certainly does seem strange that we don't carry some advertisements for sports wear. Other magazines do, and we dare say their readers don't spend half the time in the open that we do. Most F.A.C. units spend many week-ends in "camp" and certainly during the coming Fall and Winter seasons hundreds of leather jackets, sports shoes, wool socks, sweaters, etc., will be purchased by members of the F.A.C. Readers, before you purchase, drop a little note to the manufacturer from whom you intend to buy, pointing out the tremendous possibilities afforded through the advertising columns of YOUR magazine—FLYING ACES.

THE other day, the New York representative of the Murine Company came into our office to get the complete "low down" on FLYING ACES. He stated that he had been asked to call on us by his Chicago office following reception of a letter from Bert Macpherson, of Hamilton, Ontario. The Murine representative asked us if Mr. Macpherson was one of our advertising agents and was much surprised to learn that Bert is merely a member of the F. A. C. and wrote that letter out of sheer loyalty to the club and FLYING ACES. Moreover, it appears as though the Murine Company is going to advertise—thanks to Bert!

All of which makes us conscious of the fact that great numbers of our members are writing letters to various manufacturers, hoping that sooner or later they will advertise in THEIR magazine. True, some of these F.A.C.'s are seeking "points" which will bring them closer to the D.S.M., or perhaps the First, Second or Third Prop. However, the big motive behind fully 98% of those letters is outright loyalty to the F.A.C. Members and readers realize that the more advertisers we have, the more money we're going to have to spend in putting out a bigger and better FLYING ACES, and this to them is the all-important factor.

Not a week passes but that ACES UP receives numerous communications to which are attached copies of letters written to prospective advertisers. Naturally, these letters are of great interest to us, and since they are written on the writer's own initiative, they are convincing. To date, however, while we of GHQ are deeply appreciative of this unselfish spirit on the part of our members, we feel we have done little to actually show our appreciation. Just the other day, our Editor, Mr. A. A. Wyn, said: "Why don't you have our readers send in copies of the letters written to prospective advertisers and award a little token of appreciation for the best?" This was a great idea, so here's what we've decided to do: We have purchased a dozen genuine WINCHESTER pocket knives and will send these knives to the 12 persons sending us copies of the best sales letters already written to manufacturers. ACES UP and DOUGLAS ALLEN will judge the letters. Their decisions will be final.

While on the subject of loyalty, we want to thank the many F.A.C. Flights and Squadrons who have made it a rule to purchase only from FLYING ACES advertisers, wherever possible. We know positively that many a unit is making it a practice to buy those model kits advertised in FLYING ACES in preference to those not advertised, although users may have experienced success with the latter products before becoming members of the F.A.C. Fellows—and you girl F.A.C.'s, as well—we're mighty proud of this almost unbelievable loyalty and the awarding of these knives represents the first of many little ways by which we hope to show our appreciation from now on. And by the way, girls, if one of you members of the Fair Sex wins a knife you can give it to your brother, Dad, or boy friend in exchange for the price of a good movie, and if this can't be arranged, old ACES UP will send you the price of the movie himself. Fair enough?

What articles do you think should be advertised

~ in ~

FLYING ACES?

NAME
THEM!

Airplanes—Aviation Equipment—Motorcycles
Bicycles—Motorboats—Sports Wear—Iceboats
Ice Skates—Cameras—Razors—Fountain Pens

TELL
ACES
UP!

The coastal motor boat crew saw some of the scene, but they were many yards off towing the big 1,000-pound Whitehead to the spot beneath the derick boom. They saw the man in the scarlet mask clamber up the dripping pontoon of the black ship, crawl along the float, and climb into the rear cockpit. By this time the black seaplane was bobbing away over the rollers, and soon it swept up into the smoke-streaked sky, discharging a black, pungent smoke-screen that hid it completely.

"The Griffon!" gasped Captain Brendol.

With his Flag Officer, he raced down the companionway to the flight deck. The TG-2 stood where it had been left, the wing-tips swaying in the gentle breeze. The flight deck crew still huddled over the guard net trying to figure out what had happened.

Captain Brendol climbed up on the step of the TG-2 and stared inside. He frowned as the Flag Officer bobbed up on the other side and their eyes caught a small sheet of white paper that had been fitted over the setting knob of the Pioneer compass.

"I'll be damned!" gasped Brendol.

"Look, they're in the back," added the amazed Flag Officer.

"And that devil made a still-deck landing with those hellish things aboard.

The note read:

"Here's your red-heads. Sorry we had to down your ships, but it was either them or your carriers. It's marvelous what a little quick-drying red paint will do, eh?"

"The Griffon"

"Red paint?" went on Captain Brendol. "What does he mean?"

"You got me. These are war heads though, look at the brass detonator caps."

"But how in the name of God did he change them while those ships were in mid-air? Those torpedoes could not have been fitted with war heads after all. But they were red ones."

"Perhaps that's what he means by 'quick-drying red paint'?"

"I give up," moaned Brendol. "But get those things out of here quick! They give me the jim-jams."

"But why, if he had changed the heads without Allbright and the rest knowing it, did he shoot them down?" demanded the Flag Officer.

"I don't know, but he saved us a lot of trouble. We're all cleaned up now, and I couldn't think of a better way to do it, the rats!"

THE black seaplane with Kerry Keen in the back seat, dripping wet, raced back to Graylands, with Barney O'Dare at the controls. They were both exhausted with their efforts and flew at a low cruising speed to suck in the reviving air and relax. It was some time before either spoke, but while Keen folded his seat back and took dry clothing from a spare locker, Barney could hold his tongue no longer.

"Well, ye picked a peach that time, Mister Keen," he growled. "Ye'll be gittin' us scotched yit. I don't know

what we did or why and I care less, me bhoy, but I'd give a few bucks to know one thing."

"And what's that, Barney, old toff?" replied Keen pulling on some light but warm underwear.

"How the devil did ye know in the first place that them buckies, Schloss and Warner, were goin' to blow up the aircraft carriers? Ye just sets out with no argement at all and start kiddin' people to bump themselves off without a word."

"Um, I suppose that was a puzzler, Barney. Never thought much about that part. But keep your shirt on and wait until you hear me bend Mr. Drury Lang's ear tonight. Give her a few more notches and let's get there. I'm due for a snifter."

"Snifter is it? I'm due for a quart o' O'Doul's Dew meself. Snifter me eye!"

"You know, Barney," Keen went on a few minutes later, when he had completed his change. "I'd never have started on this game if Schloss and Warner hadn't consulted me on the mechanism of Navy torpedoes. Then it dawned on me that they were the heads of the Trans-Oceanic Lines which are about on the rocks. They had heard of the *Morro Castle* being considered for a secondary aircraft carrier, and got the idea that they might shove all their old hulks over on the government, if they could find some way of getting rid of the regular carriers."

"But—that guy Jannings you've been hounding for weeks. How did he fit in?"

"I checked the movements of Schloss and Warner and discovered that they were contacting a young Navy pilot regularly. Jannings was actually a former German transport pilot who had been tossed out of Luft Hansa for an attempt to steal a gold shipment. Jannings was given the job of contacting a group aboard one of the carriers, and Allbright was his man. Allbright got those red-heads out and planted them, and then awaited the arrival of Jannings to carry out the plan."

"And Jannings was scheduled to lead them off to a secret field after the big blow-up?" queried Barney.

"Right. That's why I had to get Jannings first to find out where Schloss and Warner were working from. He gave it away when he called that WPFS station. All we had to do then was to go up and go through Schloss' papers and find out what the rest of the plans were."

"Yeh? But I'd still like to know how you got those two guys to bump themselves off."

"Still asking questions? Well, that was easy. I taunted Warner into shooting at me. His slug hit my bullet-proof vest and broke a glass container of cacodyl isocyanide, fitted between the breast and shoulder plates of the vest. All he had to do was to hit me in the chest and the container was smashed releasing the gas. I had my mask on and was safe, but Warner and Schloss died. You see, Barney, I'm one of the real untouchables," laughed Keen. "But I had to wear a rubber suit to be safe."

IT was midnight before they reached Keen's apartment on 55th Street. They had to land at Graylands on the upper tip of Long Island, hide the black Fairey in Keen's secret hangar that nestled behind the fake rock garden, hurry in, and change. Keen selected a neat dinner coat, a soft light felt hat, and a swagger cane. Barney was sucking at a bottle of O'Doul's Dew held in one hand, while uncorking a bottle of Bollinger, '28, with the other. Then, after their glasses had clinked, Barney ran the Dusenbergs out and Keen lolled in the back seat all the way into town. He got out at 33rd Street and Eighth Avenue, walked around to the New Yorker Hotel, and wandered through the lobby. Then he purchased a gardenia at the flower stand, went out through the main entrance, and called a taxi, giving the driver his uptown address.

Ten minutes later, after a short delay in the theatre traffic, they pulled up at Keen's apartment. A dark figure darted out of the shadow and grabbed the edge of the door beside the driver's seat.

"Okay, Brennan," growled Drury Lang, flashing a badge in his palm. "Gimme it straight. Where did you pick this guy up?"

"Say, Chief!" gasped the driver. "On a stack o' Bibles—I picked him up at the New Yorker—Sure as me name's Brennan."

"Have to eat and drink, you know, Lang," said Keen with a cheery wave. "Barney's night off. He's probably soaking his head in beer, somewhere. Come on up. The driver's giving it to you straight."

"All right," growled Lang. "Go ahead Brennan. Keep the change. It's his buck!"

They took the elevator up to Keen's pent-house. Keen poured two drinks, but Lang decided to let his go.

"Well," he opened fiercely. "Where is it?"

"What?"

"You know what I mean. That torpedo-bomber ship."

"On the aircraft carrier *Rangely*—where it was supposed to be," smiled Keen.

Lang gasped and started to reach for the phone. He dropped it after studying Keen's face a minute.

"Where's the guy who killed Jannings?"

"Dead!—Jannings committed suicide. It's a long story, and you wouldn't believe it, anyway. Did it ever occur to you that the two men killed up at Portland were the heads of the Trans-Oceanic Line, Lang?"

"Schloss and Warner? Sure, I know that. What's the idea?"

"Nothing, only they're broke and are trying—or were trying—to sell their ships to the government for conversion into aircraft carriers."

Lang whistled and went on: "Okay, what's that got to do with Jannings?"

"Jannings was the guy who was going to give Schloss and Warner a chance to sell the ships," Keen explained in a

(Continued on page 66)

Flying Aces Stamp Tales

A MONTHLY AIR JOURNEY VIA STAMPS

PILOTED BY CHARLES CORWIN, A.P.S.



MAPS and charts, atlases and globes, have from the very first, been the crux of sea navigation. In like fashion, these directional and locational aids have taken a similar place of importance in the science of navigation—navigation of the air. The aviator carefully plots his route for a proposed flight; and when he hops off, you may be sure he takes with him the best obtainable air maps. Hence, maps and charts of the air are of especial interest to FLYING ACES fans.

Moreover, the aviation enthusiast, who is also a stamp collector, can combine his two hobbies very nicely by a specialized collection of stamps that feature maps. Many countries have issued beautiful stamps with the central design devoted to a miniature map.

Aviation, as explained above, demanded improved charts and new kinds of maps; and by means of aerial surveys, these better and more accurate maps were made possible. It was there-

fore quite logical that with the coming of the air mail, air post stamps have frequently depicted the charted courses of famous flights.

But how important are map stamps? Well, we will let you decide for yourself, after looking over some famous map stamps. Let us dig up the story behind these bits of gaily colored adhesive paper.

Strangely enough, some stamps have almost caused wars, and others have served indirectly to end wars. For instance the Dominican Republic (better known to some of us as Santo Domingo) brought out a whole series of nine values in 1900. These stamps depicted a map of the whole island of Haiti; but purposely, or by accident, this map under a reading glass indicated the Dominican Republic as embracing more than its share of the island. The other Negro republic, Haiti, which shared the island, not only showed that its pride and feelings were hurt but even made belligerent demands that the offending stamp be withdrawn. Small incidents have been known to start large wars, but this bit of paper, measured in a few millimeters, was about the smallest "incident of precipitation" that historians could imagine.

In South America, on the other hand, Paraguay and Bolivia were long at war over the Grand Chaco—a huge area of malarial swamps, virginal jungles, and arid waste lands. Both countries brought out map stamps showing a major portion of the aforementioned Grand Chaco as within their own borders. While the young men of the nations slaughtered each other, the non-combatants at home kept animosity burning by licking stamps that went forth throughout the world proclaiming a dispute over this area.

Sometimes these map stamps have their humorous sides, as in the case of the Canadian Commemorative issue for "Xmas 1899," in which the whole world was depicted with all the domain of Queen Victoria colored red. The rest of the world only laughed instead of getting fighting mad when it was discovered that the postal cartographer had

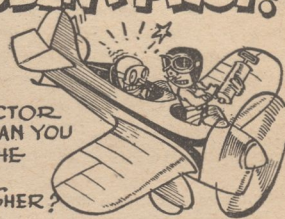
(Continued on page 80)

NEXT MONTH: EVOLUTION OF AVIATION ON STAMPS



STUDENT PILOT!

DID YOUR INSTRUCTOR EVER BEAN YOU WITH THE FIRE EXTINGUISHER?



Sometimes when students forget, they "freeze" on the controls and stall the ship! But the old hawk up in the front cockpit knows how to THAW YOU PRONTO!

THE AMERICAN ESCADRILLE



"Composed of America's Present and Future Air Pilots"

For a short period this organization offers a special membership to young men and women. The complete release of Fledgling maneuvers with 76 illustrated subjects, Air Traffic Rules, Cranking Ship, Taxiing, The Take-Off, Controls, Yaw, Roll and Pitch, The Approach, and The Landing of Airplanes—are the instruction brochures accompanying your special membership certificate.

The purpose of these lesson plates is NOT to teach the art of flying by mail. But quite the contrary. They are to be used by members of this organization as notes of instruction and reviews of what their instructor has taught, or will teach them. Their purpose is to aid him in bringing the student pilot to thoroughly understand these maneuvers and their uses and to continually keep before them the many details the instructor often has to repeat. Young men and women who are physically fit and sound in mind, who fly at present or expect to fly in the future may become members of this organization by filling out the coupon below.

American Escadrille, Gen. H.Q. Station N. Box 10, N.Y. GENTLEMEN: Herewith is 35 Cents which entitles me to the special membership in the American Escadrille and the entire list of Cadet Maneuvers.

Name Age

Street

City State.....

HANDEE

Tool of 1001 Uses

Grinds, routs, drills, carves, sharpens, cuts, engraves. Over 100 wheel shapes available. Fits the hand perfectly. Weighs 1 pound. For use at home, in the shop or take to the job. Do away with slow hand work! A. C. or D. C., 110 volt, 13,000 r. p. m.



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with 3 wheel

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Order today.

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trial. Sat-

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New

MASTER CRAFTS-

MAN'S SET

17 useful accesso-

ries to grind, drill,

polish, sand, cut, carve,

engrave, etc. Prepaid \$5.00

CHICAGO WHEEL & MFG. CO., 112 S. Aberdeen Street, Chicago, Ill.

INITIALS ENGRAVED FREE

"Wear One—Give One to a Friend" **FRIENDSHIP BRACELET** **only 50¢**

Sturdy, Aviator's Model. Specially designed. Flying Aces' Special. Made of finest quality polished chromium. Guaranteed 5 years. Your own (or friend's or Club's) initials. Advertising price 50¢-postpaid. Order today.

Wrap coin or send M. O. Send paper strip for measurement.

QUALITY PRODUCT S. CO., Box 214, Bus Bldg., Galveston, Tex.

Repeating Slingshot

AMAZING NEW repeating slingshot. Shoots 150 B.B. shot. Loads from handle. Just the thing for hunters and trappers, young and old. Shoots thru ordinary 100 page magazine. More powerful than an air rifle. Send 25¢ for one of these REPEATERS.

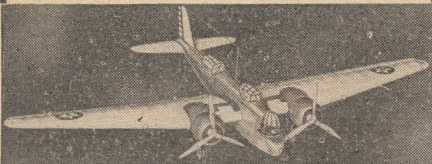
THE SLINGO CORP.

Dept. FA-10 Toledo, Ohio

BOYS! Send us 15c coin or stamps together with your MODEL DEALER'S name and address and we will send you prepaid a 25c flying model.

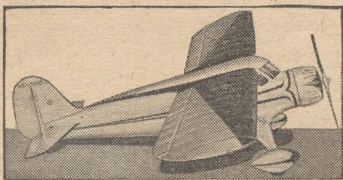
THE MODERN MODEL SHOP
FORT WORTH, TEXAS

BUILD These Beautiful Super-Detail Guaranteed Flying Planes—All in Exact Scale with Cockpit Operated Controls. Designed for you by flying men.



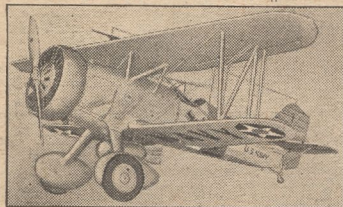
MARTIN BOMBER

Wingspan 35", length 22½", weight 4½ oz. Exact scale. Retractable landing gear, rotating gun turret, movable machine guns, special streamline cowling, two types of 3 bladed propellers—one for flying and one for exhibition with removable motor sticks for flying; rudder and elevator balanced surfaces; new type freeze ailerons. **\$3.50**
Kit complete, postpaid



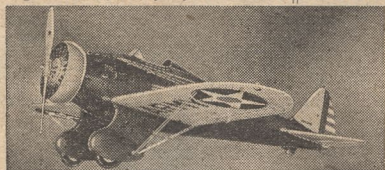
STINSON RELIANT

Wingspan 32 5/16", length 21¼", weight 3½ ozs., exact ¾" scale. Adjustable speed arresters built into the wings, movable cabin doors, complete interior with four seats and control column, and all the other Super-Detail features. **\$2.50**
Kit complete, postpaid



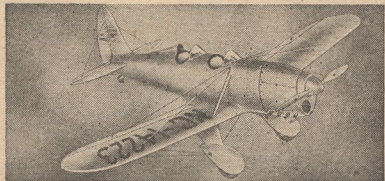
CURTISS GOSHAWK

Wingspan 23 3/8", length 16¾", weight 3½ ozs., exact ¾" scale. Coated with new IDEAL high lustre finish, with silver, yellow, red and black coloring. Kit complete, postpaid **\$2.00**



BOEING P-26A

Wingspan 21¼", length 18", weight 2½ oz. Exact ¾" scale. This flying model is an exact replica of the famous fighter—one that is identical in all but size with its noteworthy big brother. Beautifully colored in olive drab and yellow. **\$1.75**
Kit complete, postpaid



RYAN S T

Wingspan 22½", length 16½", weight 2½ oz. Exact scale ¾". Ryan has dual control system which operates in either cockpit; adjustable wing flaps; plans for making an actual working engine—4 cylinders with movable pistons, carburetor and spark plugs. Complete kit, postpaid **\$1.50**
IDEAL—The most reliable name in model airplanes

ILLUSTRATED FOLDER—Send 3c for the new IDEAL folder showing the latest model IDEAL Planes. It contains valuable information on how you can make real money by building and selling these famous flying models.

IDEAL AEROPLANE & SUPPLY CO., Inc.
21 West 18th St. New York City
Pacific Branch } MODEL BOAT & AIRCRAFT CO.
1356 5 Ave., San Diego, Calif.

See your local dealer or send this coupon

IDEAL AEROPLANE & SUPPLY CO., INC.
21 W. 18th St., New York City.
Please send the items I have checked. I am enclosing \$..... (West of Denver 25c extra. All planes postpaid.) Canadian Prices 40% higher to cover duty.
Boeing P-26A ☐ \$1.75 Stinson Reliant Airliner ☐ \$2.50
Martin Bomber ☐ \$3.50 Curtiss Goshawk ☐ \$2.00
Ryan S T ☐ \$1.50 Folder with information ☐ 3c

Please print name
Address
City State

Red-Heads of Death

(Continued from page 64)

quiet tone.

Lang almost jumped out of his chair.

"You mean . . . he was going to blow up the ships with that torpedo plane—himself? How the hell could he do it, alone?"

"He had lots of help. Ten other fellows in on it."

"Who—where are they? Let's get 'em!" growled Lang, rising again.

"Sit down! They're all taken care of—dead!" replied Keen. "You can contact Captain A. J. Brendol of the *Rangely*, and he'll tell you that five pilots of his six-ship flight of torpedo-bombers, and their crews, have been killed in an accident—during fleet problem maneuvers."

"Yeh?" answered Lang, peering at Keen through narrow slitted eyes. "And yet Jannings' ship is aboard the *Rangely*. How do you figure that out, Keen?"

"Someone must have put it there . . . landed it there, I suppose."

"The Griffon?" asked Lang in a whisper.

"Maybe!" smiled Keen. "I wouldn't know who did it. I was at the New Yorker."

"Why not come clean, Keen?" pleaded Lang.

"All I know is that Warner and Schloss tried to get me some time ago on the details of the Whitehead torpedo. I became suspicious, and checked on them—on my own of course. The whole matter was queer—their ships rotting away in dock, and all that. Well, then you came and told me that this guy Jannings was killed and I sensed that here was the answer. And there it was. I'm giving you this for nothing, so you can go and make a report on it. Per-

haps Captain Brendol will give you the rest. You can get the gravy if you can piece the rest of it together. I'm too tired to bother with it."

"What do you get out of this? There's no reward for the plane? asked Lang, puzzled and suspicious.

"Oh, don't worry about me. I got mine," smiled Keen again. "I got what Jannings was supposed to get, but you'll never know how, so buzz off and report to old Scott that you have solved the mystery of the Navy pilot who was killed by a gun, found more than one hundred miles away. That ought to get you a promotion."

Lang smiled a minute and took the drink.

"All right, Keen. You win again, but I'll get mine out of it, after all. I'm going to wire that commander and find out who landed that torpedo-plane and make that guy talk. I'll get to the bottom of this."

"Know what he'll say—that is, what Captain Brendol, will say?" asked Keen.

Lang's jaw dropped:

"Not—not the Griffon?" he gagged.

"Bet your life!" chanted Keen. "Now toddle off to bed, I'm tired."

"My God! What next?" gasped Lang, going out wearing a blank stare.

And Keery Keen, satisfied that justice had prevailed, took a wad of high denominational bills out of his jacket pocket, flipped their stiff edges a second or two, and then placed them in the wall safe behind the fraternity plaque that hung on the opposite wall.

"A quarter of a million," he smiled. "Not bad. Now all we have to do is carefully distribute it to the needy. And, oh yes, a case of O'Doul's Dew for Barney."

Bugaboos of the Birdmen

(Continued from page 16)

butt in a position where the pilot could grind it into bits without breaking his stride?

"Habit—not superstition," you say. Well, perhaps, except for one thing. Do you see that? He is still doubtful about the stump being out. See him suddenly stop, turn back, and step on the butt a second time? Turning back on a crowded city street to make sure a cigarette is out, is just a bit too much to attribute to habit. There is a jinx idea which goes with it.

YOU'RE still not convinced? Well, I know one pilot well who has developed the cigarette-butt jinx to extraordinary proportions. In his mind it goes further than the mere feeling that failure to extinguish a cigarette brings bad luck. He thinks that grinding the light from a fag brings good luck at any time—he lights them just to put them out.

He has two non-flying hobbies: poker and baseball. I have watched him at both. When the betting grows heavy in a card game, he lights a cigarette, only to immediately grind out the fire—for luck!

I watched him at a baseball game when his team was in a tight spot. The tying and winnings runs were on base and the club's best batter was up. I stopped watching the ball game to see what this pilot would do in this situation.

He did exactly what I expected. He reached for a cigarette, lighted it, then stamped it under foot. No, this ritual was not absent-mindedness. It was an effort to propitiate the gods of luck. He admitted as much when I asked him.

All that stuff sounds very foolish, you say. All right, perhaps it is. Hop in the plane with me and we'll fly over to Newark and see what some of the old time pilots will tell you about it.

But wait a minute until I get my helmet—can't fly without that. I you see well, uh I wore that helmet on my first solo and I'm kind of touchy about flying without it.

Hey! Climb in the other side, man. Don't ever get in the right side of an airplane if you can help it. If you do, then spit on the tail.

"Crazy," did you say? "Nothing in it?"

I wouldn't know—I've only been flying for eighteen years.

How To Get Good Model Photos

(Continued from page 39)

the procedure is very simple, for Old Sol will serve as your lighting plant. Your background can be made with a window shade or piece of cloth, the same as for the indoor picture described in this story. The shade or cloth can be draped over a high-backed chair, a step-ladder, or what have you, and brought down across the table.

If the sun is bright, you can set the diaphragm opening at *f.11* and the shutter speed at $1/25$ of a second and be pretty sure of good results. Should you desire a finer definition of the details of your model, stop down to *f.16* or *f.22* and set your shutter speed at $1/10$ of a second.

Unless your camera has a footage scale and is made for taking pictures closer than six feet to your subject, you will get a much larger image of your plane by using a portrait attachment which can be purchased from your nearest photo supply dealer.

When the sun is shining brightly and you have a fixed focus or box camera, you can get a good snapshot of your ship by "shooting" the same as you would for an ordinary snapshot.

There are many unusual ways to make snapshots of plane models, such as in a miniature, movie-type setting. We'll tell you how to do this in our article next month. Until then, demonstrate your ingenuity—and "shoot."

Salmson Symphony

(Continued from page 19)

latest maneuver—and I know right well that only one gun was fired!"

"And I tell you there were two guns!" Roche insisted. "They were confusing. I couldn't tell which one to signal on."

"You're a liar, observer!"

Roche's fists clenched. His eyes blazed bloodshot; and his face flamed crimson. He took a menacing step forward, but at that instant he was conscious of another movement. Beside him, Hogan suddenly lost consciousness and keeled to the ground.

A cold, dank sweat coated Hogan's expressionless face as Roche dropped beside him. When he looked up at the new man, a reproachful snarl was on his face. "Now is Hogan shot down enough for you?" he demanded bitterly.

"He should have stayed until that



MONEY AND PRIZES FOR YOU!

Win A Speedy Bicycle Without Cost!

MAIL THE COUPON



WIN THIS WATCH

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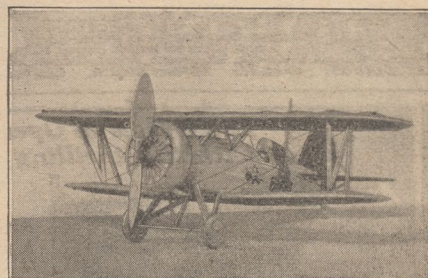
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it was Hogan—now in a hospital. It took nerve such as only Hogan had to wing deliberately into a suicide flight like that.

Colonel Fenwick seemed to read his thoughts. He suggested, a thin smile on his rugged face, "I'm a pretty good pilot."

Roche shot a penetrating glance at him. "Maybe in a Spad," he said, stubbornly, "where you've got six or seven others to keep your tail clear. But Salmson observing is meant for real skymen—not Spad pilots!"

"I can fly Hogan into a ditch," the colonel came back.

Once more Roche shot him a suspicious glance. He thought of the paper in his pocket, of the knowledge that he possessed. This man wasn't Fenwick, yet he was offering to go up, wing over the Kraut dump, risk his life. Could this impersonator of Fenwick be a German trying to wing off with a Salmson—and a prisoner?

Roche shook his head. "You won't do," he said.

At that second he fell back. A snarl of rage appeared on the face of Fenwick's impersonator. In his hand appeared a Colt, its black barrel boring straight at Roche's heart.

"I'll do, and you'll do as I say," the man snapped. "Get in your Salmson. We're going up. You're observer, and I'm pilot."

Roche hesitated. Thoughts flashed through his brain in a maelstrom. He could make a pass at the man he now knew for certain to be a German and probably die in the act. Or he could go up and become a prisoner of the Germans for the rest of the war.

His eyes fell on the Salmson, on the Lewis in the rear seat, on the wireless. The Germans obviously weren't going to move that dump, and there probably wouldn't be a circus of Krauts within twenty miles of it, much less a *Jagd-staffel*. This might be a surprise attack that would put the perfect ending to that dump. If that Kraut with the gun on his heart wanted to fly—let him fly!

Roche shrugged indifferently. "Okay with me," he said resignedly. "If you think you can do it, let's go."

The man warned him. "One funny move and I'll blow your heart right through your ribs," he said, and from the steely ring in his voice, Roche knew he would do it.

Slowly, Roche gathered his tunic from the rear pit of the Salmson and slid into it. Then he mounted the wings and jumped into his pit, a revolver on his back all the while. The pilot jumped in, raced the motor a second, and started the crate across the tarmac. Once in the air, he tossed a sheepish grin at Roche and placed the revolver in its holster.

THAT was Roche's signal for action. Like a flash he whipped the Lewis across its steel arch, threw its breech up high and pointed its blue-steel nose at the pilot's head. With a snarl he shouted into the slipstream.

"Now it's your move. You take that gun and toss it over the side. One slip and I'll tattoo the American flag on

your thick skull with this Lewis. Go on, dump it!"

The man flashed about. At the sight of the Lewis, his eyes opened wide and his jaw sagged. Without a word, he extracted the revolver and tossed it over the coaming.

Once more Roche talked. His voice was still hard, but there was impudent laughter dancing in his eyes. "You wanted to fly—now fly straight to that dump. We're going to plant some shells in it, or we're going to take up a permanent abode thereabouts. And don't forget—one false move and this Lewis will draw lines right across your head!"

"Fly over the dump?" echoed the pilot. Incredulity was in his face.

"You've got some sense at that," replied Roche.

The pilot laughed. It was a loud laugh, and a little wild, but he kept the Salmson climbing higher and higher.

Roche settled back in his seat. On and on the Salmson winged. The pilot handled it like an expert. Even the wind bucking that Hogan couldn't avoid now seemed to be smoothed out, and the creaky wings seemed to be more solid. Roche found himself admiring this Kraut's skymanship.

Over the front lines, Roche dropped his wireless aerial. Minutes later the Salmson crossed a road upon which a line of heavy trucks was threading its way toward Hill 37, FM. A puzzled frown screwed Roche's face, a frown that grew deeper a moment later when he saw a swarm of dark specks silhouetted against the blue sky over Hill 37, FM.

Fokkers! They were waiting for him, waiting for anybody who tried to wing over Hill 37. And those trucks—did they and the Fokkers mean that the dump was really going to be moved? Ahead of him he saw another line of trucks pitching, plowing toward the dumps. His face grew grimly hard. That pile of ammo was going to be distributed all along the Front that very night.

Surprise bombing? Not much! He mocked his own guess. He was the surprised one. The thought brought back the realization that he had a traitorous pilot. Once more he turned to the man, poked him in the back, and turned him around.

"Kraut, you try to land this crate or signal any of those birds and I'll—" He patted the Lewis.

The man shrugged and turned his back.

The dark specks grew larger. Not more than a quarter of a mile away were the Fokkers, an extra large circus of eleven. What a hive of hell to run into!

Roche fell to his wireless key. Under his steady fingers, a blue flame danced across the breaker bars. Dit, da, da, dit! Commence firing!

A minute later a mushroom of belching smoke and earth broomed from the earth. An instant after that a second puff ripped an earthly cavity.

As it did, Roche cursed through his grinding teeth. He pounded the pilot. "I told you! Two guns again! Why the

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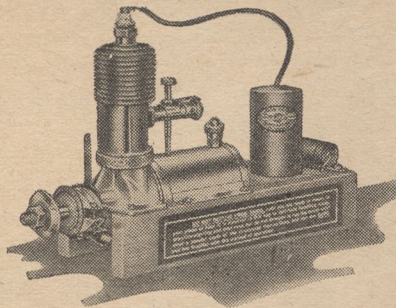
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blasted idiots ought to have better sense!"

The pilot only shook his head. Once more blue lightning played across the breaker bars. Da, da, dit! Hold longitude; latitude 200 feet north.

Smoke and earth flamed almost instantly to the left of the dumps. Da, dit, dit, da! Hold latitude; longitude 75 feet east. The message was just completed when a cone of earth smeared the earth a hundred yards south—not east—of the dumps.

ONCE more a desperate curse escaped Roche's now whitened lips. He was completely confused. Which shot was which? Which was he signaling on? Which did the 14th think he was signaling on? Baffled, bewildered, he felt a hot, smothering sweat drenching his skin. At this rate he didn't have a chance in the world of blowing up that dump. Only an accidental placement would do the trick, and the chances were one in a million against that.

Suddenly the first of the Fokkers pounded down upon them, boring in a charge of smoking tracers. With a snarl of rage, he whipped the Lewis about and lined the sights upon the flaming nose of the Fokker. Steel-muscled fingers gripped the trip, and a chattering lance of streamers smeared blue-gray smoke into the snout of the Fokker. The German crate hesitated in its flight. Its Spandaus stopped throbbing, and its prop flew off into space. Then the plane plunged earthward, screaming in its flight.

"That'll hold you," grated Roche, and once more his fingers tripped a tattoo on the wireless key.

Dit, dit, dit, da! Repeat! Earth belched from its bed almost instantly, but it was not a repeat shot. It was two hundred feet west.

Dit, dit, da! He ticked it off quickly. Hold latitude; longitude 200 feet east. Two shells burst simultaneously. One was far to the north; the other was where he had expected the "repeat" to plunk.

For a second, he frowned deeply in thought. Then, slowly, his face cleared. He was beginning to grasp this thing, now. A grim smile replaced the doubt that had been on his face, and only an oath of self-reproach left him. Why the devil hadn't he figured this thing out before?

Certainly the 14th Artillery wasn't firing two guns, yet two guns were being fired—and one was a German gun!

The German gun was fired deliberately to confuse any Yank observer and to make it impossible to get in the correct placement. In time, of course, it could be figured out; but with a circus of Fokkers winging around, an observer had to be good to dope out a trick like that. The Germans took no chances with their shots. They knew where not to plant shells. The whole thing was diabolically simple.

To test his theory, he signaled again. Trat, tat, trat, tat! Repeat!

He ignored the shell that landed first. He had to ignore it, anyway, for the swarm of Fokkers had dived around his

head like a hive of droning hornets. Once more he lashed his Lewis into action. Twisting in his seat, he picked a Fokker off the Salmson's empenage, and watched it blaze to the ground.

The Salmson now banked sharply to avoid a head-on crash with a zooming Fokker that tried to Immelmann into a killing position. The wings strained under the maneuver. Roche held his breath in anxiety, but the wings held. The pilot knew his stuff.

"Too bad the rat has to be a Kraut," he muttered. "He's almost as good as Hogan!" But Roche knew that this man was better. Aloud, he said, screaming, "You Krauts are a smart bunch, shell-ing your own dumps. But I've got you doped out, and—"

The slipstream choked his words back into his mouth, but the man ahead had heard the first words and his face went white. Startled for a second, the pilot gazed over the side of the coaming. Then once more he shot a glance at Roche.

At that instant, Roche spotted the second "repeat." It was directly where the other two shells had been, and he grinned triumphantly, muttering, "Krauts, old scouts, prepare for a little noise!" His fingers touched the wireless key again.

DOWN upon the Salmson raced a Fokker, Spandaus blazing. A stream of lead smashed across the top of the Salmson's fuselage, laced its way toward the pits, and plunged into Roche's shoulder. He recoiled under the pain, but retained his senses.

He was forced to abandon the key for the Lewis. Under the pressure of his hand it stuttered a death message to the Fokker. Then all the Fokkers remaining were upon the Salmson. One winged in from the side, right-angling its wings with the earth. The Lewis spoke to it with a staccato of lead, and the crate pulled off rather than run into that charge of death.

From behind Roche, another Fokker struck. A stinging burn under the arm warned him. He arched his Lewis to line it. As he did, he saw the Kraut pilot of his ship stiffen as an incendiary burrowed itself into his shoulder. For a second, Roche thought the Salmson might go out of control, but the Roche stuck with the ship like a leech. He pulled it up and banked it sharply away from the mass of Fokkers.

"Great boy!" screamed Roche. "Get ceiling!"

With ceiling, Roche knew that he might get through the signal that would mean that dump's finish.

Again the pilot stiffened, and this time he shuddered as though struck by a club. Across his forehead appeared a wide furrow of ugly red from which poured a stream of blood. Down his face, across his goggles, and over his tunic it flowed. He shook his head to splash it off, but the movement was wasted energy. In a second the blood would blind him completely, and with a wild thrust he tore off his goggles and hurled them into the slipstream.

His eyes were then unprotected. Once

the blood reached them and filled them, it would be all over. Roche realized the fact all too clearly. He jerked off his own goggles and leaned forward. Pulling the pilot's head back, he drew the goggles, not before his eyes, but over the wound. The felt and hair lining of the goggles would act as a stopper for the blood.

Down below him, the trucks weren't waiting for dusk to remove that dump. Truck after truck was being rushed up. Hundreds of men fell upon the shell and cartridge piles with strong, anxious arms. Loaded quickly, each truck pulled hastily away. In less than an hour, the dump would be a deserted, abandoned waste.

The sight sent a sickening wave of despair through Roche, while on all sides of him, a wave of buzzing incendiaries and tracers suddenly swept the Salmson. He ignored them and fell upon the key to his wireless.

Dit—his message broke off. The Salmson bucked with the wind. Half blinded, the pilot had let the crate fall off on its side. As it did, the aerial lashed about the fuselage, jerked violently on the drum, and shorted with the motor spark.

Roche saw it. His face went white. There was no chance of getting a message through now—not a single chance in the universe.

Coming out of the slide, the pilot turned about. Roche saw instantly that the Kraut hadn't done it on purpose; that he was still unaware that the aerial was tangled, gnarled with the fuselage. Roche also saw that the blood had seeped through the goggles and was running down the man's nose and dripping off on his tunic. In less than a minute more, it would well into his eyes, sog the lashes, and blind him completely. Less than a minute—and Roche was still helplessly unable to send the message that would end that dump.

ONCE more the pilot gave his attention to his crate. Once more Roche eyed the lumbering trucks below with savage fury, as the dump dissolved as though under a powerful acid. Then again he looked at the gnarled aerial, tangled out along the empennage. If only he could reach it and untangle it

It wasn't a thought. It wasn't an idea. It was too insane, too wild to be either. Yet it flashed through his brain and for a split second left him paralyzed; left him figuring the odds against being successful—and those odds were a million to one.

On a wind bucking Salmson—no, it wasn't possible. On a Spad, maybe, but on a Salmson, never! He couldn't crawl out on that fuselage any more than he could eat his dinner standing on his head. Then there was the pilot to be reckoned with. If he should see him on that fuselage, unbelted, the Kraut could give the plane just one little flip—and the trip would be south, through space. Even if the pilot didn't see Roche, the blood might finish him any second—

It was insane to try it, yet Roche found himself unbuckling his safety strap, resolved that that dump should

move in one direction only, and that was upward!

Crawling out on the top of the fuselage, Roche shot an inquiring glance at his pilot, but that member of the Salmson was not aware as yet of Roche's position. Gingerly, cautiously, Roche maneuvered back along the fuselage, inches at a time, slowly and firmly. The fuselage began to thin down, to give him better maneuverability.

Flat on his stomach, legs dangling on either side of the fabric fuselage, Roche crawled snake fashion. Nearer and nearer the empennage he wormed, until at last his clawing, gauntleted fingers could reach the snarled aerial. One more little move and—

The Salmson gave a violent lurch. Roche's heart sank within him, as he clawed like an ape on a breaking bough. The Kraut pilot had sighted him. Or hadn't he? Suddenly the Salmson was righted again, and riding along on an even keel. Roche hurled a hurried glance over his shoulder. No, the Kraut pilot hadn't seen him. Once more his fingers clawed the aerial.

Desperately, he pulled on it, hoping to be able to reach that pit before things happened. The meshed wire moved with his tug, and partly freed itself, but the tip of it was under the tail drag, was lashed about it and knotted. There was no getting that free.

Swiftly, his fingers went to work. He grasped as far down the wire as he could and started bending it back and forth, back and forth. In time, the copper strands would part, but probably not in time to save his life. Feverishly he worked, sawed back and forth. One after another the fine copper strands were severed. Then the wire parted entirely, and Roche let it fly out in the wind like the tail of a kite.

Over him, a Fokker burred down, hoping to cut him off the fuselage. A pair of Spandaus chattered and yammered, and a furrow of hot slugs burned through the fleshy part of his legs. He bit his lips under the pain, but held his perch and started threading his way back to the pit.

Once more the Fokker droned down upon him, and he worked desperately to reach his pit. As he looked up, he saw something that made his heart pound. He was looking into the startled eyes of the pilot!

ROCHE had no time to reason now—no time to figure out anybody's safety. It was a wild lunge he made as his feet kicked through the doped fabric, jammed against a brace, and hurled him forward. Just then, the Salmson lurched

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off on one wing as a Fokker stormed in from the front.

Clawing, groveling, Roche grasped the coaming and hauled himself into his pit. A breath of relief escaped him, but he completely ignored the safety strap as his fingers struck the key of his wireless set. A blue tracer of lightning lanced across the spark bars. His shaking fingers danced out a message.

"Dit, dit, da, da, dit, dit! Hold longitude; latitude seventy-five yards south. He sank back, then, and his fingers reached the strap, buckled it across him. He felt as though his job was done, yet he leaned toward the pilot.

"Wing in, Kraut," he yelled. "You'll never make the tarmac. Hit the 14th Artillery—it's nearer."

"The dump!" began the pilot. "It's—'Beyond your worries now.' Roche grinned and pointed down.

There was a faint whistle in the air, like the eerie scream of something unearthly. Then the ground trembled and heaved. Concussion after concussion rumbled through the air with deafening solidity. Louder and louder it grew, like the closing pulses of a great symphony. Stronger and stronger and harder and harder it pounded. Wind swept the earth like a violent cyclone, hot and burning, as ton after ton of powder exploded in one great heaving mass.

The Salmson was lifted higher in a maelstrom of currents, then settled as the wind was suddenly sucked from under its wings.

But after a time, everything was quiet. Even the heavy drone of the Rhone motor seemed somehow to be silent, and Roche glanced at the ground below. What had once been a piling ammo dump was now nothing but a great cavity in the earth. Not a truck was anywhere to be seen.

As the pilot banked to get a view of the scene himself, Roche said: "To you Krauts, that's known as the Salmson Symphony. It hasn't got Beethoven's trumpets, but it's got a hell of a lot of drum music! So now you ought to figure out why Pop Fielding got so much joy out of his fifty odd records! They reminded him of what happens to Kraut dumps when a Salmson wings over them." He grinned. "Go on, wing in to the 14th Artillery base!"

The Salmson slapped down with a crash on the 14th's grassy meadows. Blinded completely by his own blood, the pilot was unable to see the terrain, and the Salmson splintered its carriage. Roche scrambled out and stood up on unsteady legs, as men clustered about him from all directions.

Then from the wreckage emerged a figure that was bloody, tattered and grimy. Roche turned to this man, wrapped his arms affectionately about him, and gave him what little support he could.

"A Boche who knows how to fly a Salmson—and how!" Roche informed the gaping men.

"Boche?" gawked one, eyes opening in surprise. "Him?"

"Sure. And game as—"

"You're berserk, observer," the man replied coldly. "That's Colonel Chesterdon, G.H.Q. Commander in charge of Salmsons."

ROCHE almost relaxed his grip on the man. A blow on the head couldn't have stunned him more. His throat went suddenly dry, yet he managed to gasp, "You're sure?"

"Of course." A grin broke out on the artilleryman's face. "He was here to check up on those reports about two guns being fired. He found out you were crazy, so he mosied on over to have a confab with you. And from the way the earth shook ten minutes back, you must have tagged 'em pretty."

Roche could only nod dumbly. He had forced Colonel Chesterdon to take him over the dump. Would it mean court martial or firing squad? Grim scenes danced before his eyes. Well, anyway, he consoled himself, it was not as bad as having a pursuit commander for leader. Pop Fielding would want a man like Chesterdon to carry on.

Colonel Chesterdon reared his battered head to peer at Roche through the coating of dried blood. Wiping his face, he said, "You've got what it takes to carry on the 53rd Observation Squadron, Roche. Major Fielding was right about you."

"But what about you?" Roche asked dazedly.

"I've got enough trouble at G.H.Q.," Colonel Chesterdon informed him. "Salmsons aren't as easy to handle as Spads, you know. Salmson squadrons aren't as easy as Spad outfits, either. So I've got enough work cut out for me."

"I came up here because I am a friend of your late C.O. As he said, no pursuit man should try to fill his shoes. He said you were the man, but you are pretty young, and I had to make certain that you understood what a Salmson Symphony should be. Well, I see you do. Anybody who will crawl out on a Salmson's fuselage to untangle an aerial so that he can get location through must have the symphonic itch."

"And I thought you were a Kraut," murmured Roche.

"And I thought you were afraid of blood," echoed Colonel Chesterdon. "Hell, we can all make mistakes."

Roche grinned, but he had one more question. "Why did you impersonate Colonel Fenwick?" he demanded.

"Because I wanted to see what your attitude toward Spad leaders was. I found out. It's the same as Major Fielding's—and mine. That's why you're C.O. of the 53rd from now on. And now, suppose we get to where a medico can patch my head. And—oh, yes," he continued, struck by a new thought. "I want those records of Major Fielding. I—"

Roche interrupted with a slow shake of his head. "Sorry, colonel," he said. "I'm carrying on from right where Pop Fielding left off—records and all!"

Aircraft of Tomorrow

(Continued from page 5)

while airplanes cannot. A rocket machine might be built to ascend, not just into the stratosphere, but entirely beyond the layer of air surrounding the earth. Undreamed of speeds lay "just beyond the veil."

Designers still have about 150 miles per hour to play with before they will have to abandon conventional types of airplanes. But all of this speculation

and paper development that has been going on in air circles augurs well for the future of aviation. It may be that the airplane is about to undergo a renaissance—a period of rebirth. The aircraft of the future may differ more decidedly from the machines that are familiar to us today, than our modern ships differ from the original Wright biplane.

One Hun, One Hit, Three Errors

(Continued from page 9)

"Oh, put down the ink bottle," he howled. "I just thought of somethin'. Them Limeys can't do nothin' to me. Ha, ha, they had somebody with 'em who wasn't supposed to be with 'em, haw-w-w-w! They let him ride over a road that is liable to get bombed by Heinies most any time. The King in England will get a letter from me if the Limey red tabs press this case. An' I will tell the U. S. court that I blocked the road so the car would have to get off it, as I thought I saw Gothas comin'. I did not know there was an old shell hole there—well, what do you think, Major? Haw-w-w-w!"

Garrity closed his eyes, laid his head on his arm and groaned.

"You ought to take a couple of days off an' go fishin' or somethin'," Phineas suggested next. "You ain't lookin' so good, Major. I can hear your nerves snappin' from over here—" But Phineas didn't stop on his way out this time. The ink bottle smashed a panel in the door as he closed it behind him.

"Well," Howell shot at him as he sank into a chair, "gettin' court martialed is one way of getting out of fightin' von Bountz. They say there's a good chance of you gittin' shot. How much can we hope for that?"

"Life is chock-full of disappointments, don't fergit," the unquenchable spirited jokesmith grinned. "I think I'll open me a law office when the *guerre* is over. An' as for von Bountz, haw-w! I have divers ways of knockin' him off, maybe."

"Well, then," Bump Gillis chimed in, handing his hutmate a dog-eared copy of a Limey periodical. "This was just written for you. It says that in these dark hours the people who sit by the home fires are gettin' behind in their contributions to the Victory Drive, and it seems von Bountz is to blame and has got their morale down as low as your mentality. There was a lot of propaganda dropped in England tellin' how many Limeys have been shot down by von Bountz, to say nothin' of Frogs and guys like us. The King has promised a Victoria Cross to the brave aviator who'll knock off the *Hauptmann*. It says there, too, that the enlistments in the Air Corps of England have dropped forty per cent. Something must be done."

"I would say that it would be safe for even a Scotchman to offer a fifty thousand dollar prize for von Bountz's scalp," Captain Howell horned in. "It'll take more than tricks, Carbuncle Pinkham. Once that Kraut gets on your tail for five seconds at a stretch, you are finee. Did you know that two out of every three guys he has shot down got shot through the head? Ugh!"

"Oh, I ain't scared easy," Phineas retorted breezily. "I got me an idea. Like most attic rooms, it ain't quite finished off yet, but I will 'bide my time."

THE next day Phineas came out for the mid-day patrol. Major Garrity wanted to know where he thought he was going.

"Why out to fight the Krauts," replied the pilot blandly. "I always thought it was why we come to Barley Duck. If I don't go up, why I will just have to see that this letter gets to Windsor Castle. If them Limey brass hats think they can expose an heir to shell fire, well—" Phineas had barely finished issuing his ultimatum when a British staff car turned off the road leading past the drome, came around the corner of a hangar on two wheels, and shot toward the C. O. and his chief pain-in-the-neck. A portly red tab fell out, got up, and spoke in a hurry.

"Why—er—Major Garrity," he blurted out. "I came over to let you know we would just as soon forget about what happened lawst night an' all that. Ha ha! We're jolly well satisfied to drop everythin', what?"

"Y-You mean—" stuttered the Old Man, "that you're lettin' this spotted turtle here scare you out of—?"

"After all, Major," the red tab said, "we must hush things up, y'know. If Brigade finds out we were riskin' the assassination of—er—well—good mornin', Lieutenant Pinkham! Rippin' day, eh what ol' chap?"

"Haw-w-w-w-w!" exulted Phineas. "It's no end, old pip-pip. Guess we'll tear into the Krauts awright. Well, cheerio an' all that prop wash."

"By gad, Garrity," the red tab stormed as the Spads took off, "I'd jolly well like to wrap my cane around his blarsted neck."

"A" Flight ran into *Staffel* 7 again that day. But von Bountz was absent

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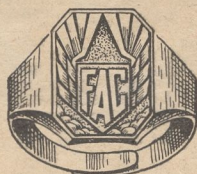
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from the scraposphere. Howell and his pilots convinced the leader of the Jerry *staffel* that he should participate in no more tricks against the Ninth Pursuit Squadron. The red and black Fokkers were cuffed around the sky for five torrid minutes before they tore back to their own side of the fence. The Jerry leader, on counting noses, found that he would have to buzz his *Herr Oberst* for three crates and a pair of replacements.

"Ach," the Jerry *Staffel* boss reported to his Squadron Commander, "maybe iss idt von Bountz he cooms und flies mit us vunce again yet, nein? Him und his smardt tricks, ja! Himmel, idt iss madt der Yangkees iss!"

Phineas Pinkham did not go back to the Ninth with Howell. After the scrap the pilot from Boonetown made an attempt to get to the rendezvous over Spada, but his Hissso had stopped a Boche slug with its larynx. Wheezing like an asthma patient, the Spad finally made a landing on the drome of a Frog outfit near Revigny.

"Bon afternoon," Phineas greeted the Frog pilots when he got out of the Spad. "Will ya call up the Ninth Pursuit Squadron an' tell them I am detained? It is hell, as this is on the level an' the ol' termater will not believe me anyways. If you got a Spad surgeon handy, I would like him to probe the Hissso's thorax for a slug."

The Frogs invited Phineas over to their quarters. There he was introduced to a visiting Frenchman who also wore the uniform of the Frog Flying Corps.

"Lieutenant," a little French pilot said to the Yank, "thees ees Lieutenant Toussard. I geet ze wine. You mak' ze acquaintance, oui? Lieutenant Toussard, he like ze gum you chew. Ze American gun. *Avez vous un leetle beet, non?*"

"Haw-w-w-w-w!" chortled Phineas. "Sure. I was just goin' to bite me off a fresh stick myself. *Ici ees ze gum, Lieutenant. I am what you call ze beeg sport, oui!*"

"*Merci*," Toussard grinned and crammed the stick of gum into his mouth.

A trio of Frog pilots stared lazily up at the ceiling. Toussard chewed and swallowed, chewed and swallowed again. Suddenly his jaws stopped moving. His lower jaw fell away and the epidermis of his physiognomy assumed a very greenish hue.

"Well, well," observed Phineas, heading for the door, "I must see the operation on my Spad. Adoo—huh—why what's the idea of blockin' up?"

One of the three Frogs standing in the doorway laughed uproariously. "Before you go, M'sieu, Toussard he ees not thank you for ze gum, non."

"Lieutenant Pinkham," a voice called.

Phineas turned to see Toussard wiping beads of sweat from his face. "You play ze trick, oui? Ha ha! You see thees—non?" He showed Phineas his left hand balled into a fist. But he hit with the right.

"Why—er—was it Gothas?" inquired the Yank when he finally sat up. "I didn't even hear 'em comin'. Boy, why—er—oh I remember. You slugged me,

Toussard. Well, I'll show ya—"

"Ze name," a Frog pilot said behind Phineas, "is Georges Carpentier. Ha, he stop by to see us. When you come in, we say you weel play ze trick so—you hear of Georges Carpentier, non?"

"Oh you bums!" yipped the taster of his own pink pills, "Will I git hunk? I am gittin' sick of meetin' guys who ain't who they ought to be. Why—huh, well as long as it was you who hit me—help me up, George."

"So!" Carpentier shot at the Frogs, "You know he would geeve to me zis awful stuff to chew, non?" He lunged forward. There followed twin sounds like distant muffled thuds of bursting shells. A pair of Frog pilots hit the floor at precisely the same time.

"Haw-w-w-w!" gurgled Phineas, holding his sides. "What a punch! That'll show them wise—"

Several minutes later Phineas went out with Georges Carpentier, heavy-weight boxing champ of Europe. And when the Yank took off, he carried a souvenir with him—an over-sized boxing glove such as is used in training camps in cauliflower alley.

"Maybe my idea will git finished now," he chuckled, flying home. "Now all I got to do is steal me an auto tire. I must lift up the morale of the Limey firesides."

THE Old Man finally became convinced that, for once, Phineas Pinkham had told the truth.

"Where did you get that boxin' glove?" Garrity eyed the Pinkham acquisition suspiciously. "What've you got it for?"

"Oh, I been wantin' to get one for a long time," grinned the embryo prize fighter. "It's to put on my left hand when I'm flyin' as I bite my finger nails somethin' awful. If that is all, Major, I would like to leave the room. I have to write a letter."

"I hate to see you go," the Old Man blazed. "You have no idea how I look forward to these chats with you, Pinkham! I wish von Bountz would meet you alone some night in a dark sky alley. Git out!"

At mess Phineas read his comrades a letter, product of his own pen.

"Dear Hauptmann," he began, "It is not big enough for both of us, this sky ain't. I have decided to get rid of you for the Allies. You can tell the High Command to stop the printing presses, as after Thursday evening propaganda about you will be about as useful to the Kaiser as his wooden horse and Napoleon hat. I will meet you over Blercourt at five-thirty P. M. sharp. Hoping that your wife has run away with a profiteer, that your house has burned down, and that you have got a double attack of itchy hives, I am very disrespectfully yours."

"That'll scare him," Howell said with sarcasm. "I bet he doesn't show up."

Bump Gillis shook his head as he looked at his hutmate.

"I would drop it all right, but I wouldn't sign it," he advised the Boone-town miracle man. "After all it is no concern of mine if the Limeys won't

enlist. Huh, well go ahead an' commit suicide. See if I care."

The Old Man came in then with a face as long as an unpaid tax bill.

"Just got a message from the S.E.5 outfit over on the Sur Marne," he said, pushing his plate back. "It took my appetite away. Von Bountz knocked off Captain McCullen, the Canuck ace, an hour ago. The Canuck landed on the Boche side just as he came to. Got his scalp creased by a slug. That'll about wash up the Limey morale."

"McCullen?" Phineas gulped. "Huh, maybe there was some mistake."

"The best pilot on this side of the fence," Howell exploded belligerently. "Well, I am glad my name won't be signed to that letter."

"What letter?" hollered Garrity, apoplectic of face.

"It's a challenge," Phineas yapped. "He can't scare me, that sausage swallower. I will fight him Thursday night at five-thirty."

"Put it in writing," the Old Man demanded. "G.H.Q. asked me to name somebody to go out and lick him. But I've got a conscience. I wouldn't even name you, Pinkham. But now—" He rubbed his hands together briskly. "I will see that a posthumous medal gets struck off right away."

"It is in writin'," replied Phineas, ignoring the remainder of the insult. "A Pinkham never reneges. I will git hunk! With everybody runnin' around lookin' like what they ain't, I'll—"

Abruptly the pilot from the metropolis of Boonetown stiffened in his chair. "Haw-w-w-w-w!" he burst out, then leaped up and dashed out.

"What's eatin' him?" Bump Gillis wanted to know.

"Squirrels," grinned Howell and attacked his victuals.

Strange things happened in the vicinity of Bar-Le-Duc that night. Major Rufus Garrity found it necessary to go into the town to attend to a little shopping. A non-com was at the wheel. Two miles from the drome a tire blew out. The non-com got out, jacked up the boiler and dragged a spare off the rack on the back of the car. He found that the inner tube was missing from it. When he dragged another tire off, he found the same thing wrong with it.

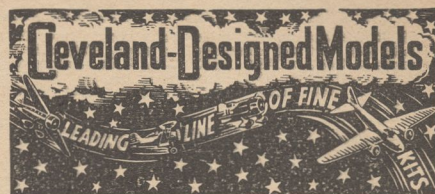
"Well," exploded the Old Man, "shall I telephone a garage or would you just as soon get your hands dirty? Hurry up, you—"

"Somebody's swiped all the inner tubes," the non-com explained. "Cripes, they was in these tires las' night. It ain't no use. If you want to ride on the rims—?"

"It's better than walkin'," barked the Major. "It's only another mile or two. Get in an' drive."

The C. O. wished that he had walked. When he got out of the disabled car in Bar-Le-Duc, his bridgework had been shaken loose. He had bitten his tongue in three places and he knew he wouldn't sit down comfortably for a week.

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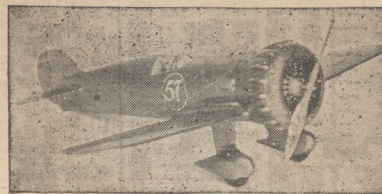
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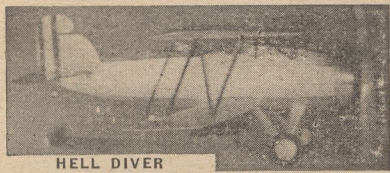


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take it off Pershin's car!" He looked up at the sky. A Spad was roaring over the roof tops.

"That's Pinkham," he yelled. "That fresh mug. Just when my back is turned, he grabs a ship and goes joy-riding. Now I'll bust him whether he writes to the King of England or not! What do I care for the damn' Limeys? They—er—good evenin', Colonel! Ha ha, how's everything on the British front? Nice to see you again an' lookin' so well. Er—a—good evening. Ha—"

"Sounds like he's blotto," the Colonel said to his companion. "Blarst it, I can't remember now what he said about the King. If I was bloody well certain, I'd—oh, come along, Fitz-pepper."

PHINEAS PINKHAM kept on going until he found a place to set the Spad down near Vaubecourt. Then he walked a mile over to the shell hole where he had soused the Limeys.

"I'm glad it ain't so cool tonight," he grinned and took off all his clothes. He slid into the shell hole and began to grope around. For almost two minutes nothing but bubbles could be seen on the surface of the muddy water. Then Phineas' head bobbed up. A frog slid off it as he waded his way out of the water hole.

"This thing weighs a ton," the kiddier tossed out with a pint of water, "but it ought to come in handy." He lugged it to the Spad and fastened it to a strut. Then he got in the battle bus and flew back home. He beat Old Man Garrity in by ten minutes and was sitting in the Operations Office when the Major barged in.

"It saves time," he pointed out. "I knew you'd chase an orderly after me so—" He raised his eyebrows.

The C. O. threw the purchases he had made in town into a corner and shook a fist in Lieutenant Pinkham's face.

"Who said you could go out? Who gave you orders—?"

"I got a big fight on, ain't I?" argued Phineas. "I've got to train, ain't I? Do you think Georges Carpentier fights without trainin'?"

"We'll let that pass," Garrity bel-lowed. "Do you know anythin' about inner tubes in that squadron car? Did you lift them, you lop-eared—?"

"Always blamin' me," groaned the patsy. "It's a good thing you were here last week when the Gotha egg bit a hole in the hangar or else you would have had an autopsy performed on me to git the canvas back. I'm gittin' tired of bein' blamed for everythin'. Huh, inner tubes! Now what would I be doin' with inner tubes?"

The Old Man could not answer that one. He just dropped the whole thing and walked out of the Operations Office, out of the old farmhouse, and down the road for two miles where he sat on a rock and concentrated on untangling his nerves. Meanwhile, Phineas Pinkham went to a hangar where Flight Sergeant Casey and three groundmen were looking at something alien to the drome.

"Lootenant," inquired Casey, "are ya

goin' to take a trip over the North Sea or what? That diver's helmet—of all the nutty—"

"Have a care how you speak to a superior," Phineas admonished him severely. "All of you kiwis trot out an' leave Casey to me."

"I was afraid of that," Casey groaned and leaned against a work bench.

"Now here is a big strip of inner tubin', Casey," began the jokesmith. "You git down under the lower wing of the Spad and fasten each end of it somehow on each edge of the wing close to the tip. I don't care how you do it so long as it is done securely. It'll make a swell slingshot. I'll use somethin' besides a stone, though. I'll be back in an hour to pass on the job. Adoo until then."

"I know why I been seein' so many chipmunks lately," Casey spat when Lieutenant Phineas Pinkham had ankled away. "That crackpot!"

In his hut, Phineas ignored Bump Gillis and dug into his trunk. He brought up a little sack of plaster of paris. He set it down on the floor beside him. Then he took the big boxing glove from a hook on the wall, picked up the plaster of paris, and walked out of the hut.

"You wouldn't understand, Bump," he called back through the doorway. "So I didn't discuss it with you. Don't wait up as I have no idea how late I shall arrive. Adoo."

"Cuckoo — cuckoo!" Bump sing-songed and flapped his arms. "Look out for butterfly nets, you nitwit!"

An hour after midnight Phineas congratulated Sergeant Casey for the efficient job he had done with the strip of inner tubing. He handed him six cigars.

"They ain't loaded, either," he grinned at the groundman. "What would I do without you, Casey?"

"I just wish you would try an' find out sometime," Casey snapped. "I'm goin' to bed now. If the Old Man ever sees that inner tubing!"

"It is all for the Limey morale," Phineas explained blandly. "Any ends justify the mean—I should say the means should—sure, that is what I mean."

Before he went to his bunk, Phineas went out back of the row of Nisson huts to examine something he had soaking in a pail. "Now if the sun shines strong tomorrow," he mumbled, "I should be in the pink."

The next day, Bump Gillis dropped Phineas's note down over a Jerry drome and almost got knocked off by two Fokkers and a battery of archies on the way dromeward. Word trickled along the front that the amazing Phineas Pinkham had challenged von Bountz to deadly combat in the scraposphere. Brass hats came in at intervals during the day to slap the Pinkham scion on the back. Limey red tabs brought him good cheer in bottles and told him how brave he was. One British Colonel handed the hero of the moment a letter which read, "Good luck, old chap. Wales."

The Wing Commander deplored the fact that conditions warranted the tol-

eration of personal sky fights, but since it was more than imperative that von Bountz be knocked off, Lieutenant Pinkham had their consent and good wishes. Generals got together and decided to risk their valuable torsos in an attempt to get close enough to the palpitating lines to watch the impending epic of the air lanes. And on the German side, von Bountz sipped *Schnapps* and strained at his leash.

"Der Tag," he kept saying over and over. "Ach, I will be der toazt of Potsdam!" Herr Obersts warned him and cited other occasions when great Heinie aces had gone out to meet *Das Pingham*.

"Ja?" von Bountz bristled. "Budt I am nodt to be fooled efen vunce. Mein Fader he did nodt raise foolish *kinder*, nein. You tell der Kaiser, ja. Ho ho!"

With the zero hour drawing near, both sides thumbed down on unnecessary patrols. Only observation crates and bombers spotted the skies as dusk drew near on the fateful day.

"I'm glad my name wasn't signed to that letter," spoke Captain Howell in the frog farmhouse as the great Pinkham sat waiting for the minutes to tick away. "Look at that crackpot. He's even enjoying that beef sandwich. I wonder what would scare him?"

"I can't stand eels," Phineas said. "I faint when I see one. Well, I think I'll git ready."

"You've got an hour yet," Major Garrity snapped.

"Oh, but it'll take that long," said the Boonetown patriot.

The Old Man brushed a hand over his eyes. Bump Gillis looked as solemn as the door of a morgue. Captain Howell chopped up a magazine with a pair of scissors.

"He ain't so bad at times," Pilot Wilson said. "Kind of fun-loving an'—"

Major Garrity suddenly jerked loose from his chair and crossed the room. He picked up something and began to swear. "My electric fan! Who in hell tore it apart? The prop is gone. By cripes, Pink—"

"I saw him with it," said Howell. "He said he'd give it to you."

"Oh-h-h, that flop-eared baboon!"

AT exactly five-fifteen that afternoon the Old Man and his pilots walked out onto the field to see the strangest sight they had ever met up with since Phineas' arrival at the drome. He was standing up in the pit of his Spad and three ack emmas were lowering something down on his head.

"A diver's helmet," Garrity hooted. "That crazy loot! This is the worst I ever—well, I'll tell that damn' fool he can't—"

"He couldn't hear you," Bump Gillis contributed. "So what's the use? Maybe if you spoke through the air hose that's stickin' up, he might get what you say."

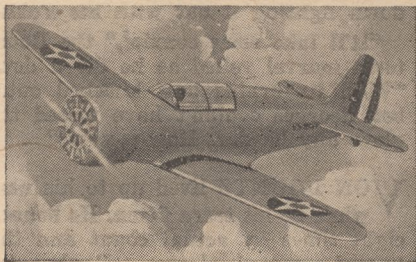
"He'll have to fly sittin' forward all the time," Howell groaned. "Well, he won't die of a fractured skull—that's one thing."

"Let 'im go," Garrity clipped. "To hell with it! I've seen enough now to know he ain't right. He'd better get shot than go through life cuttin' out paper hats."

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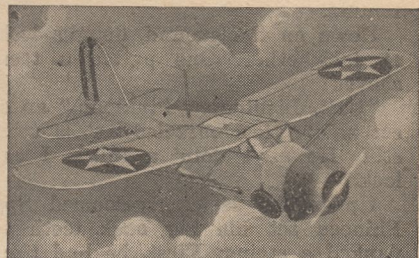
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Pilots cheered anyway, as Phineas gunned his Spad across the field. Garrity walked back to the farmhouse, went upstairs, and locked himself in. He got a bottle out of a closet and sat down on the bed.

"Here's to you, you big-eared pecan," he toasted, pouring himself the biggest snort of his life.

Phineas Pinkham and Hauptmann von Bountz met over Blercourt at exactly five-thirty in the P. M. Flying squadrons on the ground were hushed. Infantry officers laid bets. Doughs looked up at the two ships and forgot to duck when shells broke up.

Phineas felt topheavy as he slipped away from von Bountz's first burst. He straightened out quick lest the diver's helmet drag him clear of the pit.

"It's hot in this thing, too," he muttered. "I bet somebody stuffed up the air hoses. Ow-w-w-w!" The Pinkham brain whirled. Its owner heard a terrific ringing in his ears. It felt as if he were in a wash boiler and somebody had begun smacking it with a tack hammer.

"It worked!" he yowled. "He got on my tail an' smacked me in the dome with them slugs. Well, if I don't smother, I might get that Heinie yet."

Hauptmann von Bountz indulged in some rare Kraut blasphemies as he zoomed to get a little more altitude.

"Der tricks vunce again, hein?" he roared. "Der difnk helmet he wears. Ach, sooch a *schwein*! Vell, I gedt you next time, ja. I gedt him in der place

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where idt iss der glass, ho ho! I show der trickster. On drei sides he has glass vinders, nein?" He dropped down, then, Mercedes wide open, Spandaus ready to roar when he got the Spad pit dead in his ringsights. His prop boss pointed at Phineas' left wing, he came roaring in.

"Vun second und—kaput!" yelled von Bountz.

Down on the ground, doughs looked at each other. One patted a trench shovel.

"Exit, Lieutenant Pinkham," an officer said. "He's barreled an' is scared stiff. He ain't doin' a thing. I can't look."

Up in the seemingly-doomed Spad, Phineas set his big buck teeth and yanked a string. First, he had tipped his bus a bit to the right. The boxing glove loaded with plaster of paris was sent on its way by the slingshot made of inner tubing.

Kerwha-a-a-a-ang!

Hauptmann von Bountz's hand was just squeezing the Spandaus when he saw that thing flying straight for his point. His hand fell away as it came with terrific speed, looming up bigger and bigger.

"Donnervetter! Himmel—Gott!" It was too late to do anything about it.

Crash!

"Haw-w-w-w!" Phineas yipped. "Right on the schnozzle. Well where's the towel? Why don't they toss it in?" He banked around to see "von Schnoutz" headed for the linoleum without a prop. Phineas wanted to hear that Mercedes screech as it tried to shake itself loose from the supports that held it. He yanked up his nose,

arched over, and flew upside down. The diving helmet slipped from his shoulders and went spinning down.

"Boys, that is a load off my shoulders," Phineas said as he righted the Spad. "My lungs are flatter than lily pads, phew-w-w!" He gulped in gobs of air and looked around for von Bountz. He saw the Heinie a thousand feet down fighting it out with his Fokker.

"It'll take some coaxin'," the Boone-town marvel yelled as he dived down. "With its brains half knocked out. I bet Georges couldn't have tossed that glove any harder. Haw-w-w-w!"

VON BOUNTZ lived up to his name when he hit terra firma. He bounced eight times by actual count and then turned a cartwheel over a Yankee dug-out.

"He don't look so good," Phineas said later when he peered at the Kraut ace. "Are ya sure you got all of him out of the wreck? Somethin' seems missin'. Haw-w-w-w, it's his front teeth! I must find them and make a necklace for Babette. Well, call up the Limey brigade headquarters and tell them not to worry about morale any more."

Von Bountz groaned and opened his eyes. "Ach, Gretchen, idt iss always you play so rough yedt. You pooshed too hardt and look vhat happens. Right from der roof of der house I fall. Himmel—idt iss der barrel mit beer you t'row, ja. I see idt coom und—Gott! Mein headt idt splidts mit hums. Ach!"

"It ain't no use to talk sense to him for two days," Phineas said. "His marbles are scattered all over the sector, bums. Somebody get an auto or some-

thin' for me to ride back to my Spad in! That one over there'll suit me."

"Oh it will, will it?" an infantry officer said. "It's only a general's. We will just dump him out an'—"

The designated car rolled up as Phineas was thinking of a comeback. The general got out and grabbed Phineas by the hand.

"Wonderful, Lieutenant! Marvelous! I'll drive you to your squadron. Someone else can come and get the Spad. You've had enough of it for one day, I'll wager. Out of the way, men—let the Lieutenant pass."

"Haw-w-w-w!" grinned the hero. "Yeah, please step aside as I bruise easy."

"It's a nutty guerre," sighed a dough as the general's car rolled away.

The Ninth Pursuit Squadron had received the good word in advance of Phineas' arrival back at the field. All the Spads were lined by way of a salute.

"Why Major," Phineas tossed out, "was you thinkin' of comin' to save me? Why—I can't er—I just am overcome—words fail me. It is touchin' me to the quick. Why—"

Major Rufus Garrity wished that the general had kept out of it. He felt like tearing the rain gutter off the house and wrapping it around the fresh buzzard's neck, hero or no hero.

"Why, come in, general," Garrity smiled, pulling himself together, "we must hear all about it. Sit down, Pinkham. Have a drink?"

"Huh, somethin's wrong," Phineas said to the general. "They never treated me like this—I get it! It's the company I keep. Well there is not much to tell. If all those guys I met up with had been what they was s'posed to be, I wouldn't have thought all this up. If the Limeys had not had an heir to the throne with them, they would not have hired a diver. An' I wouldn't have thought of such a thing as that helmet to stop from gittin' shot from behind. Then when Georges Carpentier socked me, I says to myself, what wouldn't I give to hit von Bountz like that! So I figgered a way of doin' it. It was the inner tubin'—"

"He ducked."

"Oh it was, was it?" Garrity howled.

"Quiet, Major!"

"Sorry, General," the Old Man grated.

"Gr-r-r-r-r!"

"That inner tubin' stretched plenty," Phineas grinned. "It give that loaded glove an awful punch. I held it in place by a little hook and then kicked it loose by pullin' a string. Was that Heinie surprised, oh boys! They will fool with me, huh?"

"Amazing," the General exclaimed. "By jove, Pinkham!"

"Phineas," Garrity wanted to know, "there's one more thing. That electric fan of mine. Why did you bust it up, you cock-eyed—er—hero?"

"You would not shoot a torpedo without a little propeller on its tail assembly, now would you? Well, I says, the boxing glove will go straighter if I fix one so I took it out of the fan an'—oh, I will pay for it. I—"

"Fancy," the General said, "Major, some day I will not be surprised to learn that this flyer of yours is credited with

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the first principles of the aerial torpedo. My, we might have made history today."

"The Pinkhams have made a lot in the past," Phineas said. "My grandfather—why look! The C. O. has fell asleep!"

Aerodynamics Simplified

(Continued from page 34)

to slip. From this illustration, we can conclude a very important fact: "For every force there must be two bodies involved, one body to exert the force and another to receive it."

Our next topic of discussion is horse power. Work, we say, is the overcoming of resistance. If a box is pulled with a force of ten pounds for a distance of five feet, a certain amount of work is being accomplished. Work is equal to the applied force times the distance. If we were to calculate the work accomplished in pulling the above box five feet with a force of 10 lbs., we will have done 5 x 10 or 50 foot-pounds of work. Likewise, a person weighing 130 pounds would accomplish 1300 foot pounds of work if he were to walk ten feet. Work equals force times distance, or, as it is stated:

$$w = f \times s$$

When we speak of power, we are adding the term "time" to work. Power is the work done at a unit rate, generally expressed in minutes or seconds. For example, if a piece of work of 7200 foot pounds were accomplished in 60 minutes, then in one minute the power would be 7200/60 or 120 foot pounds. In one second the power would be 7200/3600, or 2 foot pounds. Thus—

$$\text{Power} = \frac{\text{work}}{\text{time}}$$

Regardless of what one may do, or what a machine may do, energy is being spent and work is being done. Energy, we say, is the ability to do work.

There are two types of energy: Potential energy and kinetic energy. Potential energy is energy obtained to do work through position. A weight raised to a certain height is in a position to do work. Suppose the weight is 5 pounds. If it is raised to a height of 10 feet and allowed to drop, it will have accomplished 50 foot pounds of work. Potential energy may then be computed by multiplying the weight by the distance it falls.

As the weight falls, it is losing its potential energy. As nothing in nature can ever be destroyed, the potential energy is being converted into another form of energy, i.e., kinetic energy. Kinetic energy is the ability to do work through motion. At the time the weight strikes the ground, the potential energy has been completely converted into kinetic energy.

The computation of kinetic energy is much more difficult than that of potential. However, as this formula is an important one, we will develop it so that the reader may get its full meaning.

"Oh no," Bump Gillis yipped, "not with his eyes open. He's in a kind of coma. Git a doctor!"

"Yeah?" came Garrity's weak voice. "Get two doctors. Even I can only stand so much. Aw-w-w-w-w cripes!"

The work accomplished by a falling body is equal to the force times the distance it falls.

$$\text{work} = \text{force} \times \text{distance}$$

From our third law of motion we know that the force is equal to:

$$\text{Force} = \frac{wa}{g}$$

Substituting as follows we obtain:

$$\text{work} = \frac{wa}{g} \times s$$

The reader will recall in last month's article the derivation for the formula, $V^2 = 2as$. Suppose that we solve for the distance (s) in this formula.

$$s = \frac{V^2}{2a}$$

Since "s," or distance, in this formula involves velocity and acceleration, we can substitute as follows:

$$\text{work} = \frac{w}{g} \times \frac{V^2}{2a}$$

Cancelling out the "a" and completing the solution, we obtain the following formula for computing kinetic energy: work equals kinetic energy, or—

$$\text{K.E.} = \frac{WV^2}{2g}$$

In the above, (W) is weight of the body in pounds, (V^2) is velocity squared in feet per second, and (g) is gravity, or 32.17 feet per second per second.

Work, we have said, is the same as kinetic energy, so that we can change the formula as follows (where work is equal to force times the distance):

$$\text{work} = F \times s$$

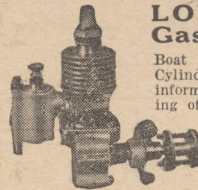
$$F \times s = \frac{WV^2}{2g}$$

In this latter equation, we can compute the force necessary to stop a moving body within a certain distance. For example, a car weighing 3,000 pounds is traveling at a speed of 60 M.P.H. (88 feet per second). What braking force must be applied to stop the car within 100 feet? Substituting in the above formula and solving we have—

$$F \times 100 = \frac{3000 \times 88^2}{2 \times 32.17}$$

$$F = 3610.8 \text{ lbs.}$$

A uniform stick, say 12 inches long, will balance 6 inches from either end. This point, being in the center of the stick, is the center of gravity. The center of gravity may be defined as a point on a body where we can consider the entire weight of the body as being con-



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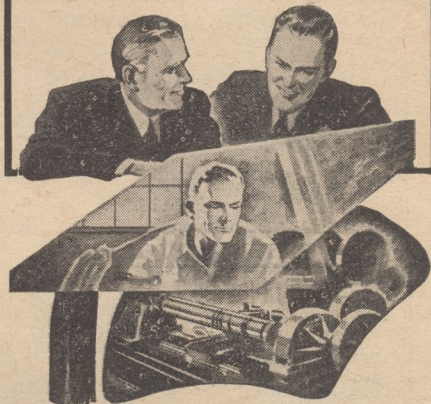
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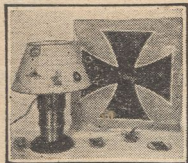
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centrated. If we were to place a fulcrum anywhere other than at the center of gravity, the stick would not balance. However, by adding weights to the shorter (moment) arm, the center of gravity will eventually move to the fulcrum, and the stick will again become balanced.

This fact is a very important one in aeronautics, since the airplane itself must balance with the C.G. in a certain position, or as close to it as possible. As

we shall see, the weights of the airplane are shifted so that the moment arm and weight on one side of the C.G., balances the moment arm and weights on the other side of the C.G.

We have now concluded our study of the various principles which are essential to our study of aeronautics. Next month we will begin our study of aeronautics by considering the flow of air around various bodies, paying particular attention to the flow past airfoils.

Flying Aces Stamp Tales

(Continued from page 65)

included some German and American possessions in red. This map was in some respects prophetic, since after the world war the German African colonies did come under Great Britain's mandate. But this does not excuse the error. The artist wielding the brush might well have exclaimed, "Is my face red, too!"

Greece brought out a beautiful large stamp in 1930 which showed graphically the territorial growth of the Hellenes from 1830 to date. Turkey diplomatically complained because one of their islands was included in the Greece stamp map. But the Greeks had not only a word but a whole answer for it. They came back with the statement that Mr. Turk claimed too much territory himself on his own stamps, for did he not proudly reach into the heavens and steal a star and a crescent for many stamp designs? So the Greeks had the last laugh.

In 1928, Newfoundland issued a map that contained a cartographic error in which "C. (cape) Bauld" appeared in the wrong relation to "C. Norman." Three years later, Newfoundland made up for any past errors by issuing an air mail stamp that was not only beautiful but particularly interesting to FLYING ACES fans because it showed a series of routes of historic trans-Atlantic flights plotted in graceful and accurate sweeps. Seven distinct courses can be distinguished, each labeled and dated. This would make a splendid companion stamp to the French commemorative of Bleriot's cross channel flight "1909" which appeared in 1934 and was described in FLYING ACES Stamp Tales last August.

The French island colony of Madagascar presents this year a colorful map of that country with a high-wing monoplane bearing the insignia "F-AKDY" (see illustration).

Spain honored the Gallarza flight (Madrid-to-Manila) with a Red Cross charity issue. These stamps appeared in deep ultramarine & orange, carmine & yellow green; dark brown & ultramarine; dark green & brown-orange; and magenta & orange. A monoplane was featured superimposed upon a map of the whole route, which skirted the North African coast and passed over

the Suez canal, Arabia, Northern India, Siam, and Southern China, with a water hop to the Philippine Islands. This European-Asian map stamp is also interesting because though it was a Spanish stamp it was printed in England. Moreover, when it was used for mailing purposes, it was not sold to the public but affixed by the postal clerk. Later, when it was outlawed for mail use, it was sold through the Red Cross to collectors. The receipts were devoted to charitable purposes.

Another map stamp hails from Russia and was issued in 1927 to commemorate the First International Air Post Congress held at Moscow. Almost the whole world is illustrated on this stamp, with the land of the Soviet, of course, featured. A plane covers the Atlantic Ocean.

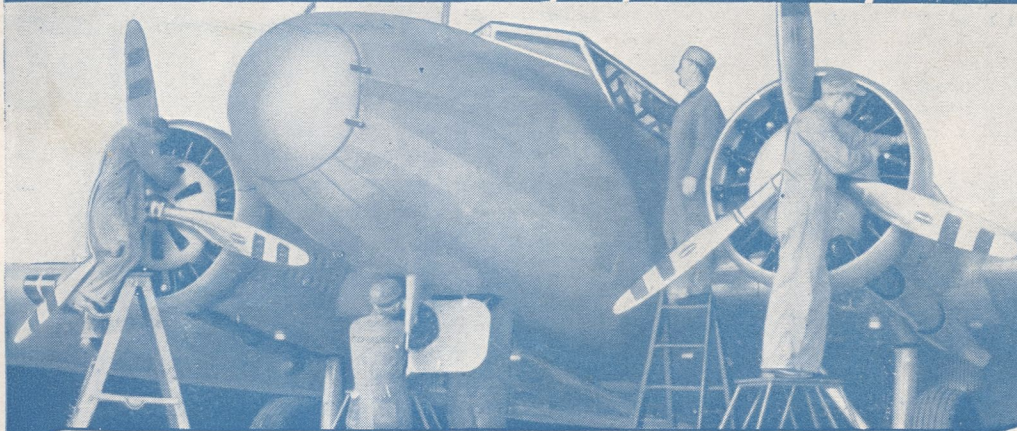
Russia has also brought a number of other detailed map stamps for air mail uses, one of which presents an odd view of the North Polar regions, with an ice breaker and a monoplane thrown in for good measure. Still another shows the great circle of the earth with a giant dirigible exploring the arctic regions.

With these examples as a starter, the air mail stamp collector or the map stamp specialist can plot a course of exploration and discovery among thousands of stamps—a course that will absorb as much time and patience as one wishes to give. It has been estimated that nearly three thousand air mail stamps alone have been issued to date, and new ones are coming out almost every week. To collect all of those stamps would require the expenditure of nearly \$25,000; but on the other hand, hundreds of these stamps can be picked up for a few cents apiece. Moreover, some of the air mail stamps that are so reasonable today will increase in value or interest with the passage of years. Besides, think of the fun and education one can obtain by studying the history, geography, politics, and aviation lore that is wrapped up in these miniature steel engravings.

There is even a game called "Stampo" that is played with maps and stamps reproduced from issues of the world.

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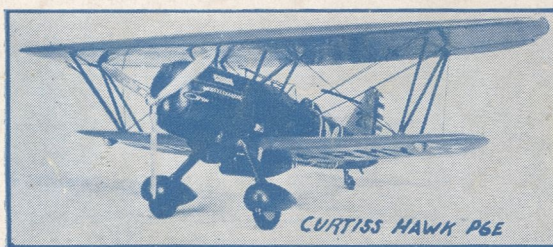


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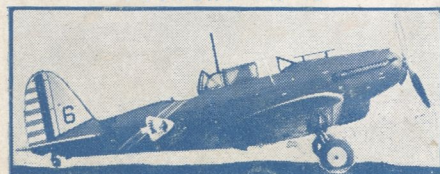
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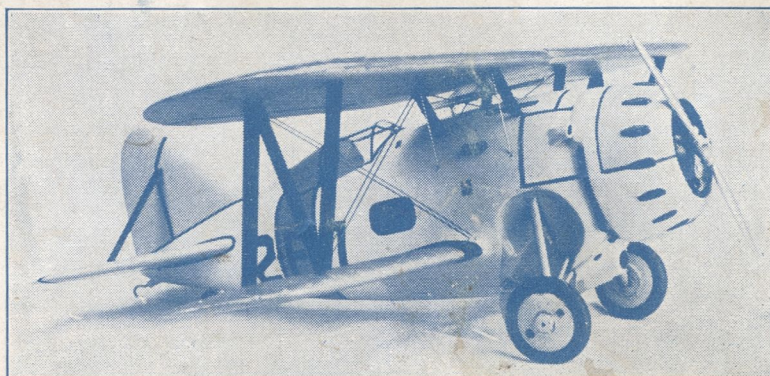
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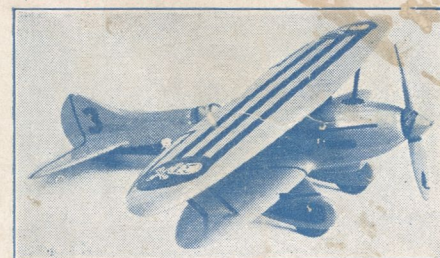
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