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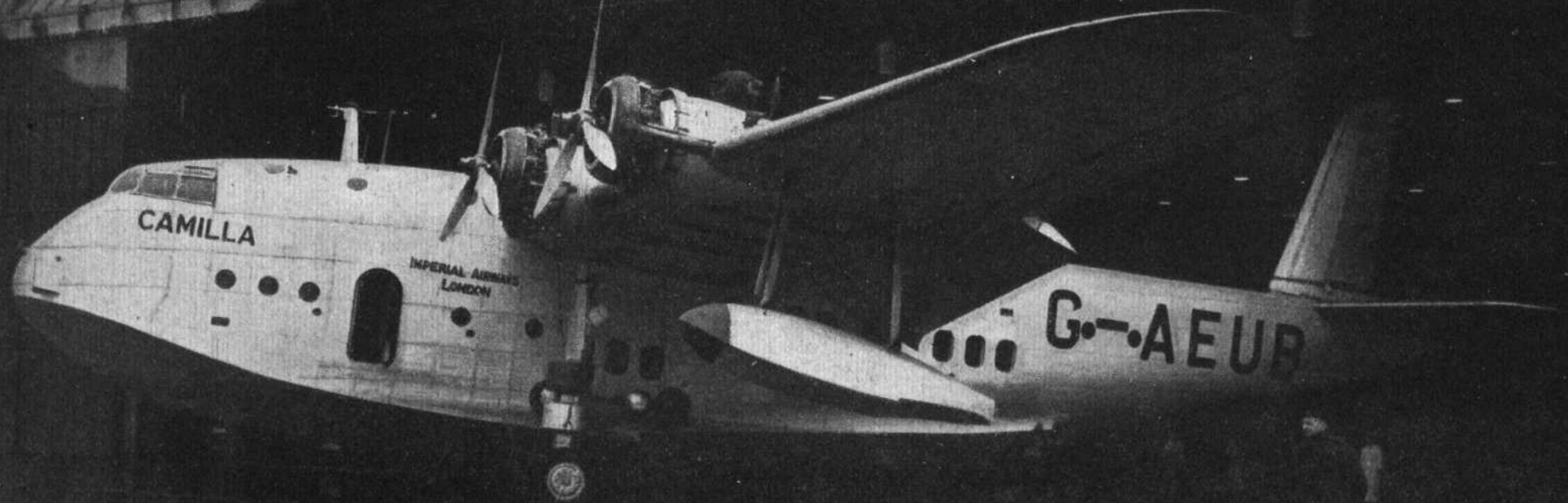
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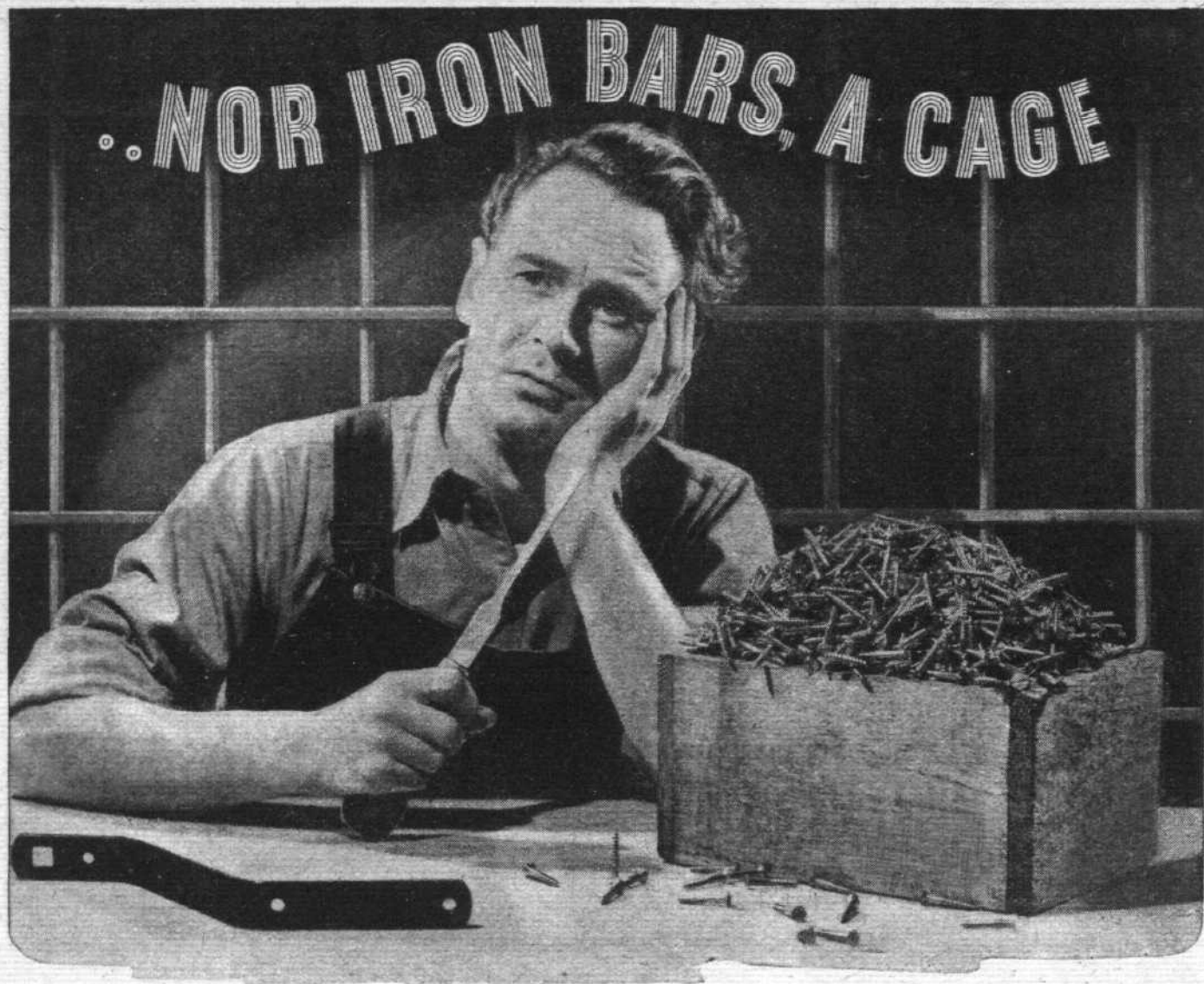
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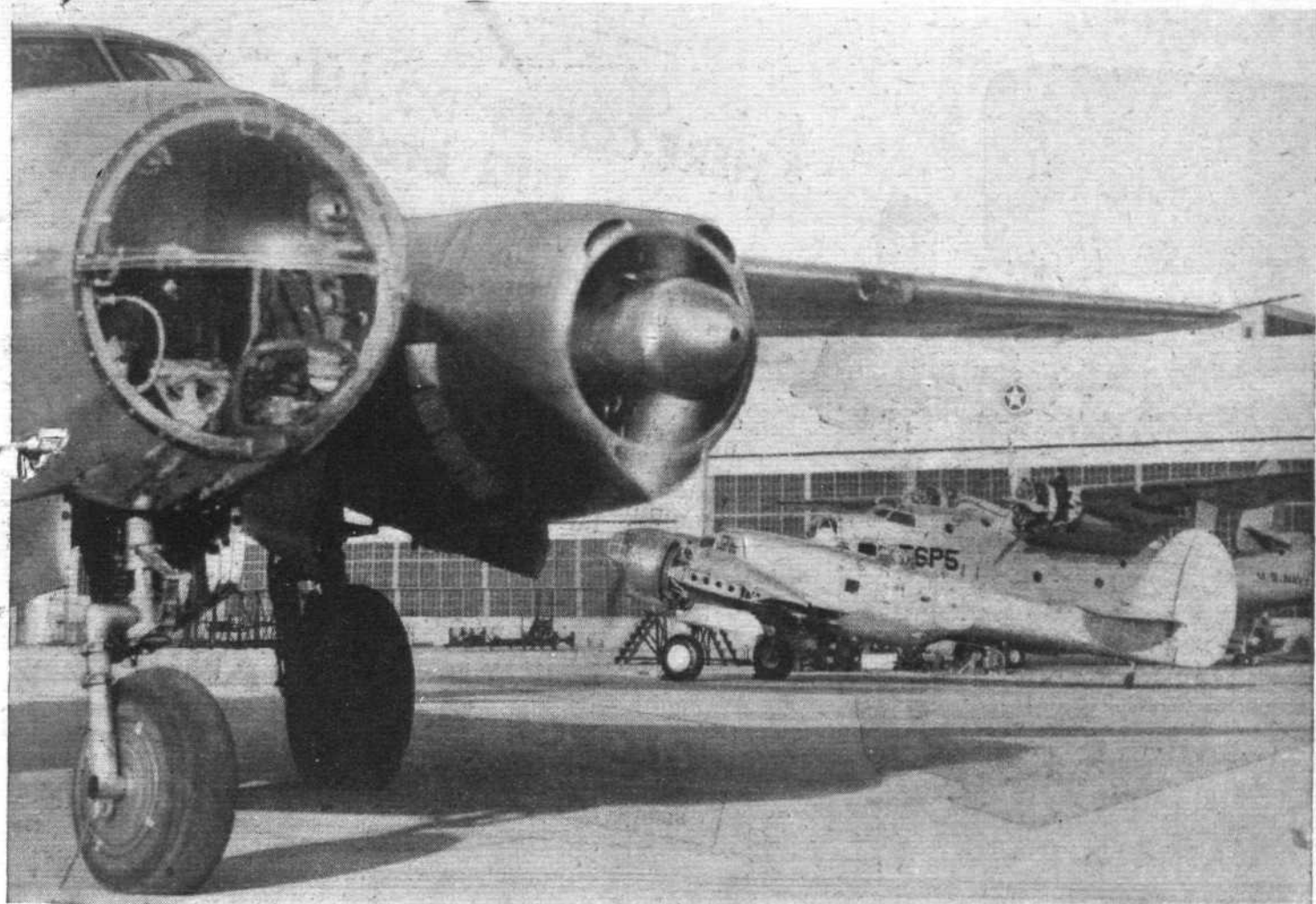
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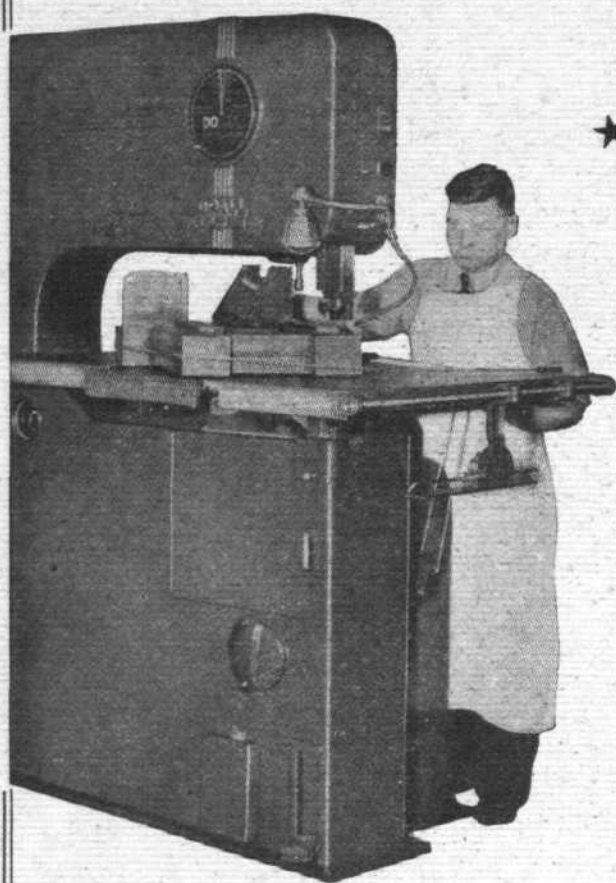
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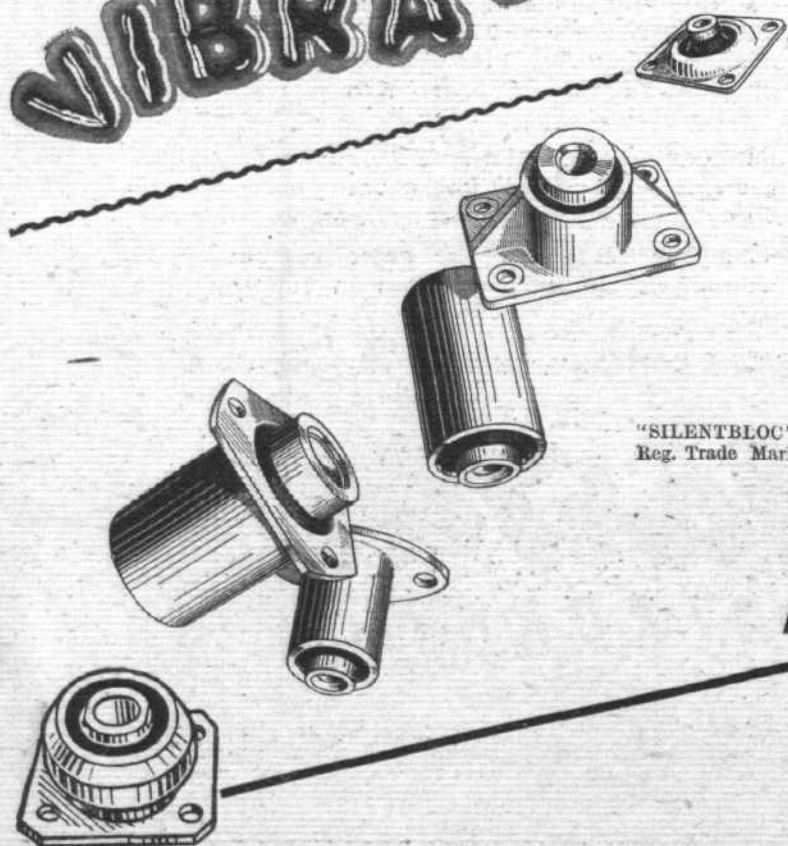
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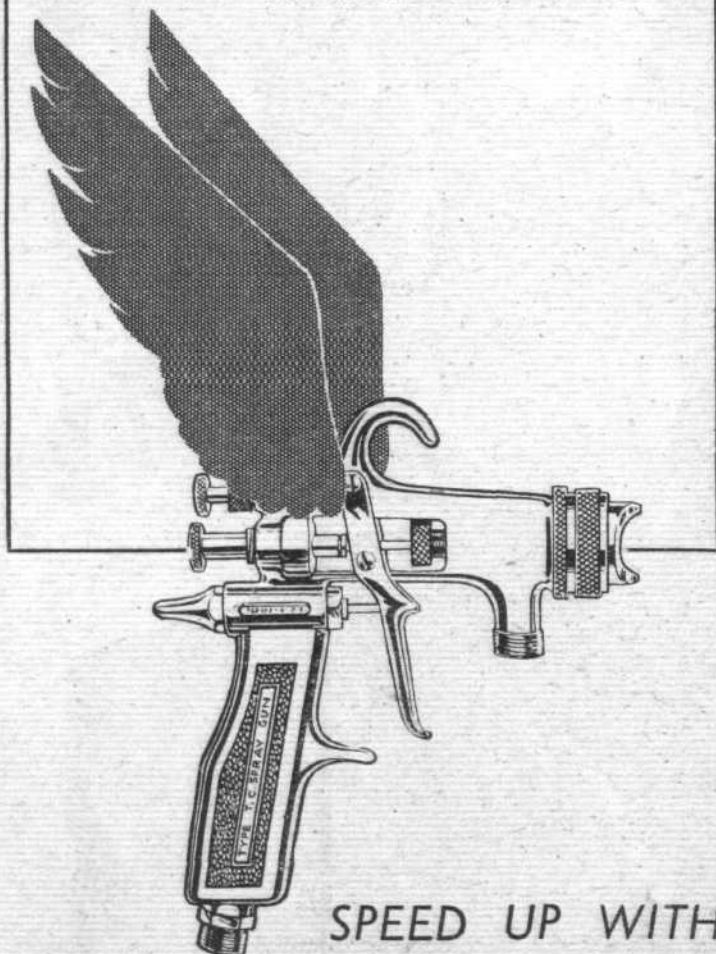
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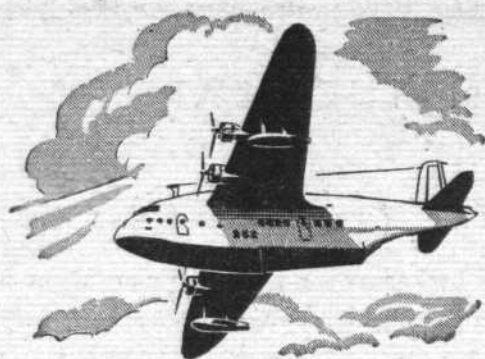
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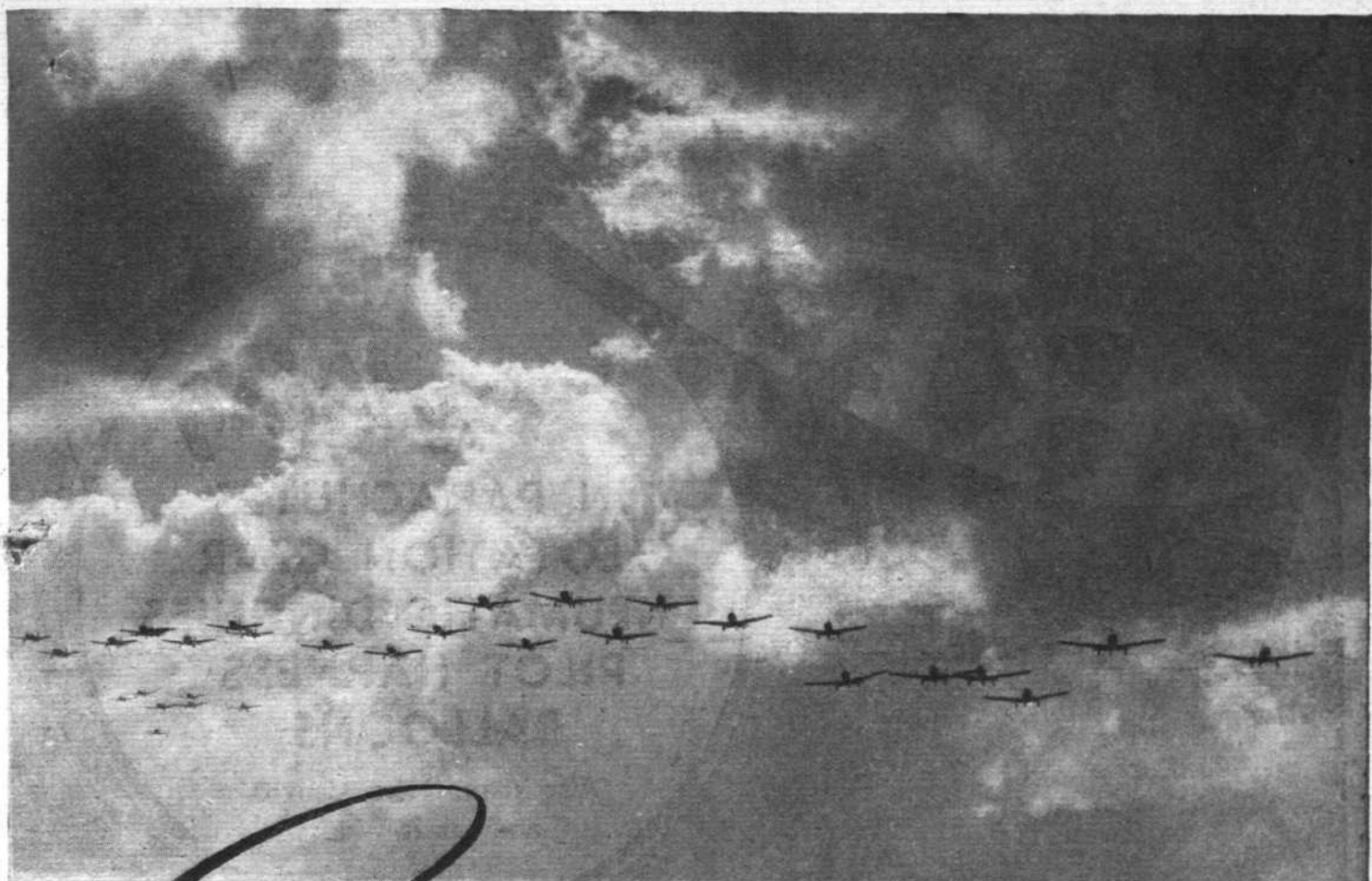
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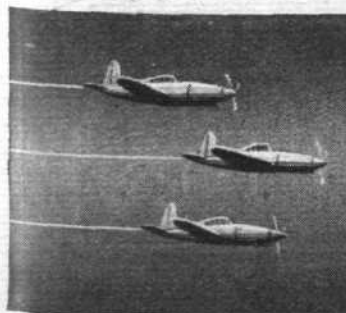
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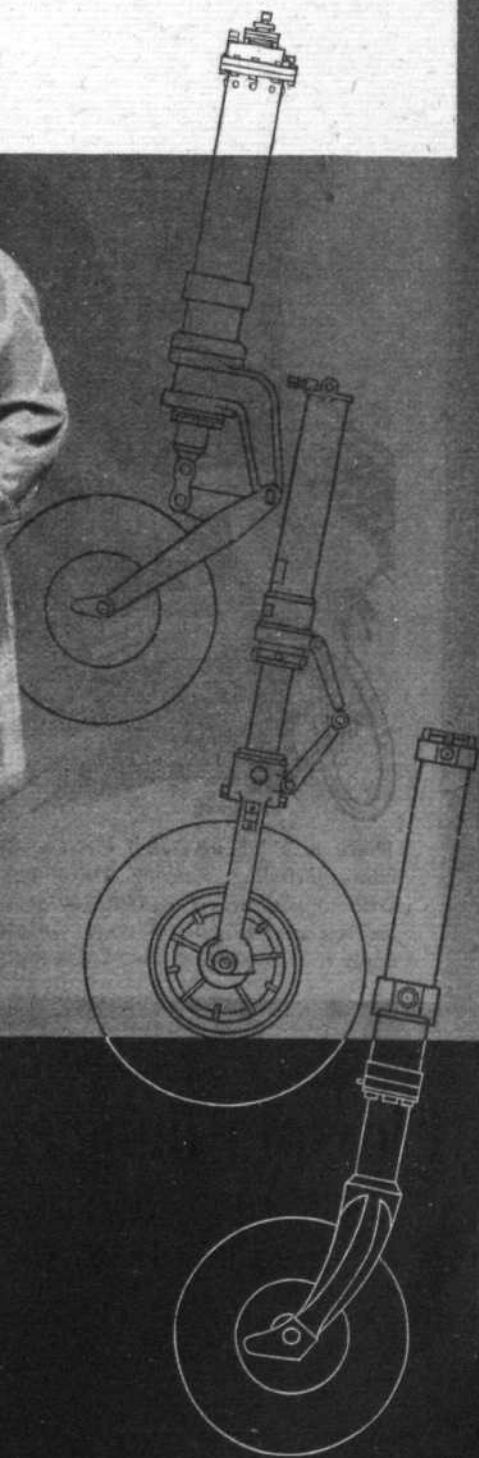
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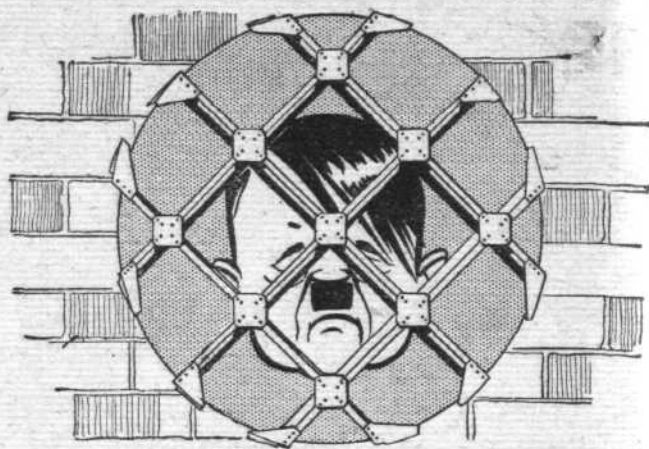


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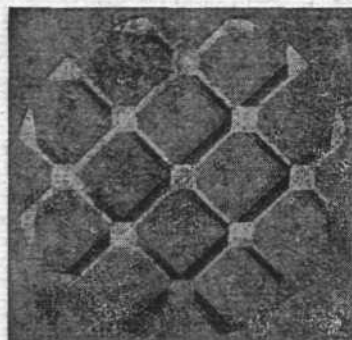
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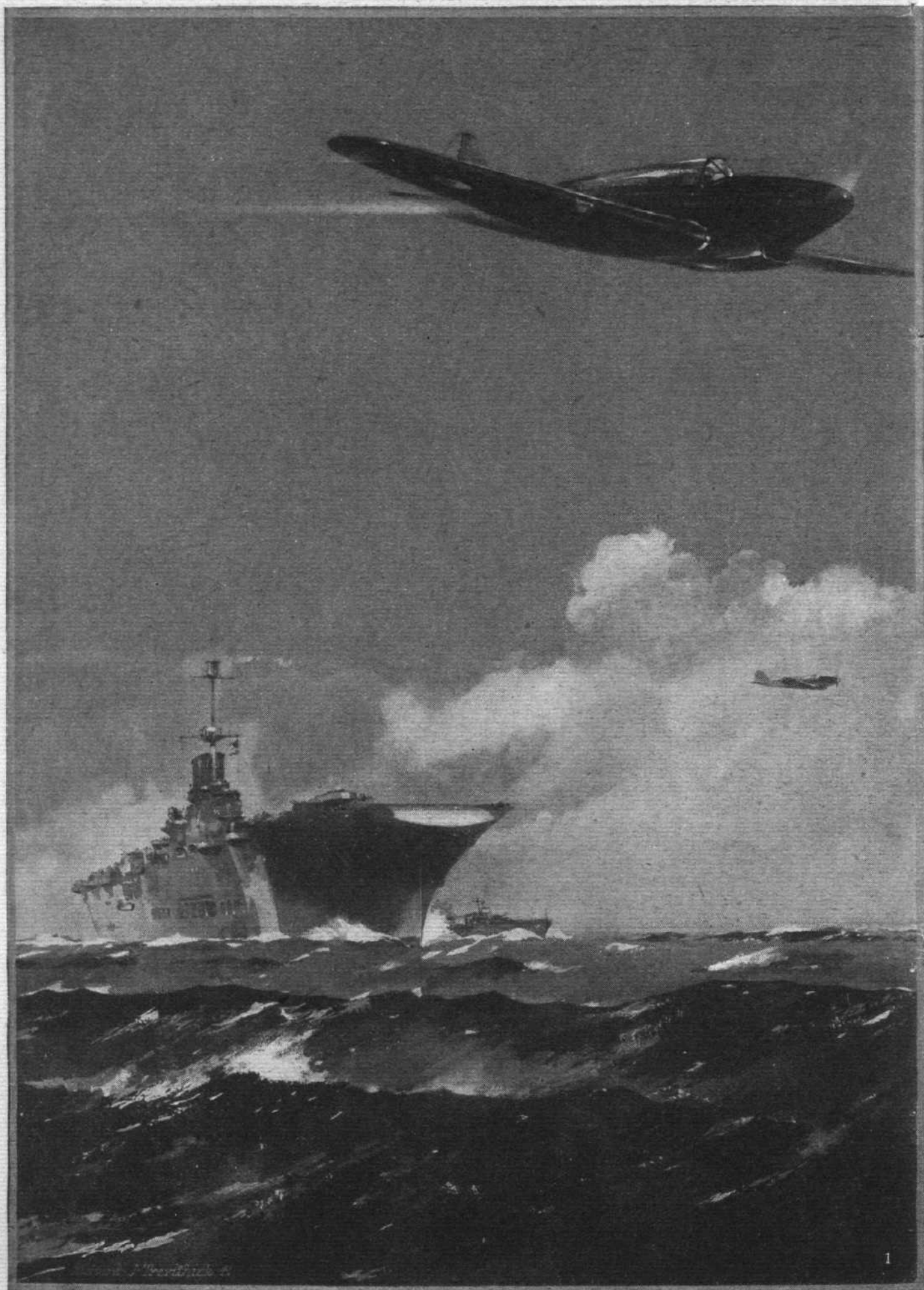
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FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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MAY 15th, 1941

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The Outlook

A Great Opportunity

BY merging the Ministries of Transport and Shipping into the Ministry of Wartime Communications, the way appears to be open for certain other changes which may, at first glance, seem out of place and premature at the present time, but which on closer examination are found to link up very well with other aspects of the newer reorganisation.

For a number of years there has been in this country a school of thought which held that commercial aviation should be given greater freedom by being divorced from the Air Ministry. It was argued that the Air Council was of necessity so preoccupied with service aviation that it could not be expected to devote much attention to the problems of commercial aviation. When the Gorell Report was issued in 1933, Col. Moore-Brabazon, now Minister for Aircraft Production, signed a minority report in which it was advocated that civil aviation should be removed from the influence of the Air Ministry. Thus the idea is far from new. However, at that time there were reasons for retaining the Directorate of Civil Aviation in the Air Ministry.

Now that all transport is to be reorganised and rationalised, it seems logical to include civil aviation in the reorganisation. Civil flying is an important factor in wartime communications—far more so than is generally realised—and it appears logical to suggest that the Department of Civil Aviation might be transferred to the Ministry of Wartime Communications.

Col. Moore-Brabazon will not, as Minister for Aircraft Production, be directly concerned with civil aviation, but he may be expected to lend a sympathetic ear to any requests that might be made for the handing over of certain surplus aircraft for civilian flying duties.

We should imagine that Mr. Leathers, the new Minister of Wartime Communications, would be fully alive to the importance of civil aviation, and it would be worth giving the scheme a trial. Perhaps later on it will be wise to consult, and collaborate with, the Ministry of Reconstruction. As a first step we suggest a committee of enquiry to study the question of post-war civil aviation.

"Secret" German Engines

PROBABLY most of our readers will have realised that in wartime the production of a technical journal such as *Flight* is attended by considerable difficulties. Of restrictions there are a great many, and in the main these are sensible and obviously designed to prevent the communication to the enemy of information which might be of value to him. From common-sense no less than from patriotic motives we have always kept scrupulously to the spirit as well as to the letter of the law in such matters, and exercised reasonable restraint. In more than one instance we have drawn the attention of the censors to certain matters which had been passed for publication, but which we considered it against the national interest to publish, with the result that they were recalled and not published.

To reasonable restrictions we do not object in the least. There comes a time, however, when official restrictions arouse strong protest through sheer lack of official understanding. A case in point occurred recently when a certain firm invited friends from the aircraft industry and the technical Press to inspect certain captured German aero engines which had been completely stripped to reveal all the details. Permission was granted, not without a good deal of time-wasting argu-

ment, on a strict undertaking being given that no word about the visit or the German engines be published afterwards!

It should be made clear that this occurred *before* Col. Moore-Brabazon became Minister for Aircraft Production. Had it happened after that happy event, there might have been some excuse in that he might have been unaware that, some six months ago, the technical Press was invited by the Ministry of Aircraft Production to inspect these self-same German engines elsewhere, and was, in fact, invited to publish descriptions of them for the benefit of the British aviation world in general. For example, such a description of the Daimler-Benz D.B.601 was published in *Flight* of November 7, 1940. Yet in May of 1941 the same Ministry deemed it against the national interest to publish anything. Truly the ways of bureaucracy are obscure and unfathomable.

The Iraqi Revolt

THE rebellion in Iraq is deplorable, not only because it shows the hand of the Germans stirring up trouble for us, but because it has resulted in fighting and shedding of blood between British and Iraqis, who ought to be friends. It is probably true that the bulk of the population of the country is in no sympathy with Rashid Ali and his pro-German gang, but none the less that gang has been able to use the Army and its Flying Corps against the British. It was the Royal Air Force which trained and organised that Flying Corps and helped it in its early expeditions against rebellious mountain tribes, making over to the pupils all the responsibility which they could handle, but coming promptly to the rescue when the situation grew too difficult for a young and inexperienced body. Iraqi freedom, Iraqi power (such as it is), and Iraq's position as an independent member of the League of Nations, are all due to the good offices of Britain. The good blood split and the bad blood engendered by the attack on the British are a matter for tears.

Rashid Ali had, however, miscalculated the degree of power which British tutoring had contrived to infuse into the flying arm of Iraq's Army. The British reply was prompt and effective. Though presumably some R.A.F. squadrons had left the country for the Middle East, those which remained were sufficient to overwhelm the aerodromes which we had made and handed over and to

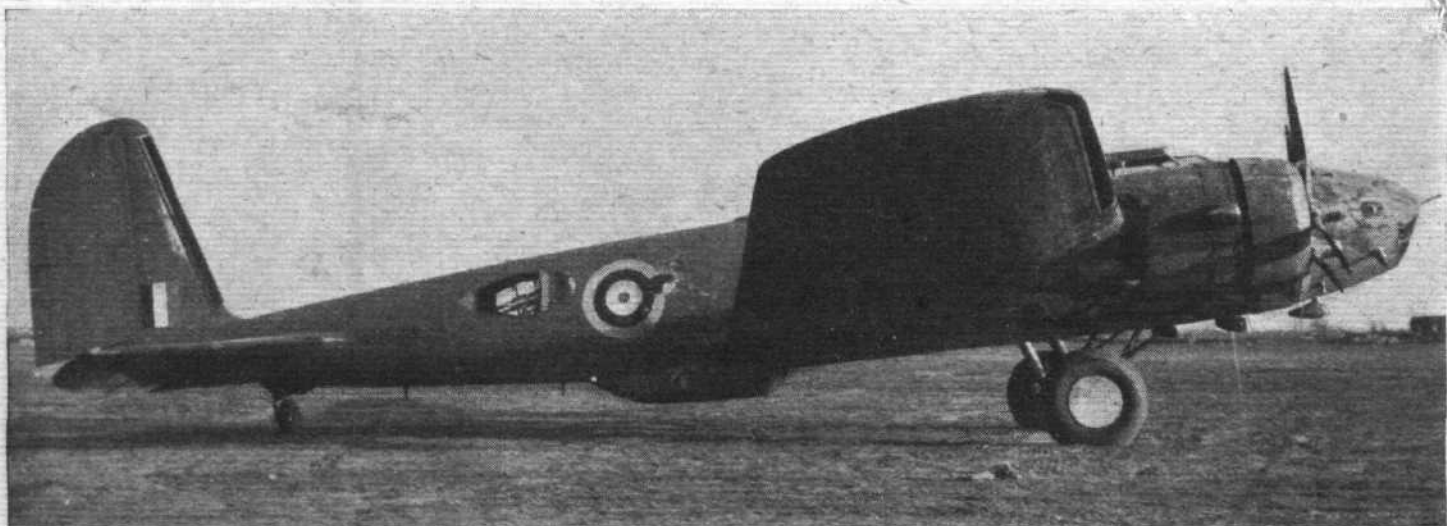
silence most of the guns which had been firing on Habbaniya. Howitzers were brought up by air, doubtless in bomber-transport aircraft, and added to the discomfort of the Iraqi troops. It was soon reported from Cairo that the greater part of the Iraqi Flying Corps had been destroyed. It is much to be hoped that the legitimate rulers of the country, who are loyal to the treaty with Britain, will soon regain control of the country. It is most satisfactory that the neighbouring Arab rulers have shown no sympathy with the rebels.

American Production Rate

A PERSPECTIVE view of the present rate of production and export of U.S. military aircraft appears on another page of this issue. It is a heartening picture, for it shows how the monthly production total is rising not only steadily but at a rate greater than we dared to hope. The rate at the start of the year is 900 per month, as given by the smoothed-out curve in which small variations have been eliminated; each month shows a total greater than that of the preceding month by 150 aircraft. Though it may be unlikely that this expansion rate can be maintained throughout this year (if it were, it would give a monthly rate at the end of the year of 2,700), it seems very likely that a rate of 2,400 per month will be reached by that time.

Not all these aircraft will come to the United Kingdom, as the analysis of the January figure shows. It will still be a considerable time before the British account receives the 3,000 per month mentioned by Lord Beaverbrook in his broadcast of July, 1940, when he said "Mr. Morgenthau, Secretary of the Treasury in the United States, will approve plans to put into immediate production airplanes for our account up to a total output of 3,000 per month. These plans will be developed without delay."

Our writer on production matters warned readers (in the issues of August 1 and 8) that a considerable time must elapse before this rate could be attained even for total American production, and still longer before this number per month would be coming to Britain. Happily, both the total American production and the flow to this country are attaining formidable proportions—figures which compare not unfavourably with any of those, except the most fantastic, which have been quoted for German production.

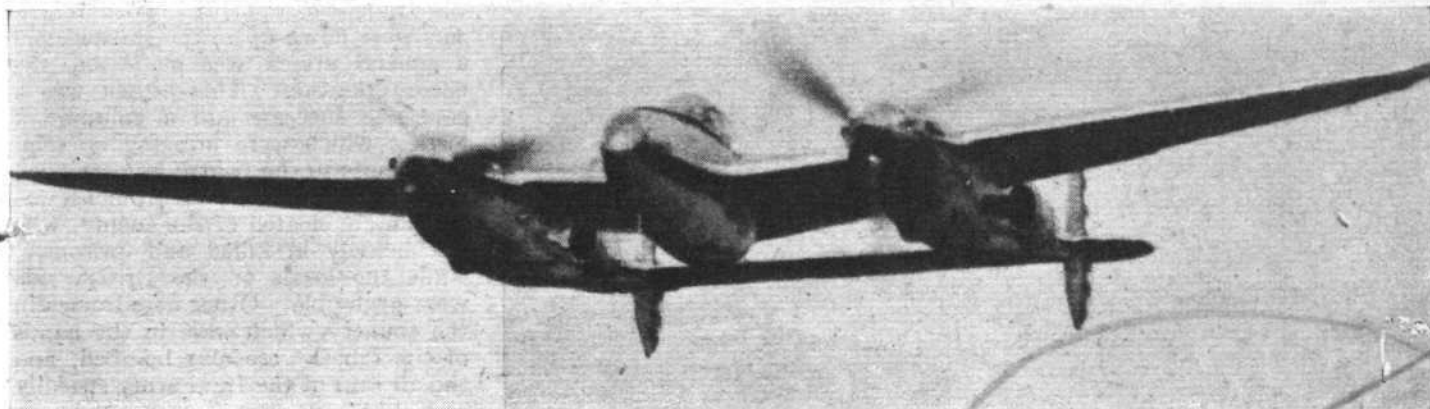


THE ABOVE HAVE ARRIVED: Boeing B.17.C (Flying Fortresses) continue to arrive in this country by air from America. In its latest form, with four Wright Cyclones of 1,200 h.p. each, the top speed is in the region of 300 m.p.h. Cruising at 220 m.p.h. the extreme range is 2,450 miles. The fuselage gun-turret blisters have been removed and slipstream deflectors substituted.

Photo
news

War in the Air

Gneisenau and Scharnhorst Hit : Heavy Toll of Enemy Night Raiders



Aggressive Non-aggressor: (Above) The Lockheed Lightning twin-engine single-seater fighter. A tricycle landing gear is fitted and the airscrews revolve in opposite directions.



Aggressive Aggressor: (Right) The Focke-Wulf 189 reconnaissance fighter. Shell guns as well as rifle-calibre machine guns are included in its armament. It appears to be very vulnerable to a head-on attack.

THE fine nights which went with the young May moon were very favourable for bombers on both sides. The Royal Air Force continued to make heavy attacks on Brest, where the two German battle cruisers were still lying, on Mannheim, Hamburg, and other targets. In two raids on Brest hits have been claimed, this time on both the German warships. To do the maximum damage it is necessary to use armour-piercing bombs, and these must be dropped from sufficient height to enable them to attain their terminal velocity, or at least sufficient velocity to be able to pierce the armour of the ships. On the first of the raids aircraft of the Bomber Command carried a great load of heavy armour-piercing bombs to Brest. Occasional thin ground haze drifted across the harbour, but the battle cruisers and the surrounding dockyard showed up clearly under the moon, and pilots reported very accurate bombing. Direct hits on both battle cruisers were claimed. Sticks of

the heaviest bombs also fell repeatedly across the dry dock in which one of the vessels is berthed. Many bursts, accompanied by flames and smoke, were observed on and about the jetty where the other is tied up.

Bombing the Battle Cruisers

ONE pilot spent an hour and a quarter "going backwards and forwards," as he put it, over Brest. He made three runs over the battle cruisers before he bombed. "On the first run the bomb-aimer could not see either of the ships," he said. "So we climbed and tried again. This time there was a devil of a lot of *Flak* coming up at us. Again the bomb-aimer was unlucky, but on the third run we caught the reflection of the moon on the water and the outlines of the docks stood right out. The front gunner was the first to spot the ships, then the bomb-aimer picked them up. Then we bombed." The claims made on May 7th were even more confident.

The *Luftwaffe* for its part continued

to raid ports on the western side of Britain, and also Northern Ireland. Clydeside, Merseyside, and Belfast suffered heavily. But if the fine nights helped the bombers, they also helped the defensive fighters. In the first week of May over 70 German night raiders were destroyed by R.A.F. fighters and A.A. fire. It would be foolish to draw too large conclusions from this very gratifying success. The time has not come when we can proclaim that the night bomber has been mastered; we cannot even hope that such a rate of destruction is likely to be maintained when the sky is not lit brightly by the moon. It may even be that it is to the advantage of Britain when visibility over her shores is bad, when the raiders cannot see what they are doing, and when the defences cannot take toll of them. But the knowledge that the Germans cannot come and go unscathed has a very cheering effect on the British people in general, and in particular on those in the districts which have suffered most.



Iraq Target : A section of the oil pipe line, with an emergency landing ground alongside.

the Iraqi encampment. Then howitzers were flown up to the station, and a general attack was made on the enemy position. This attack was a complete success, and a column of lorries, which were bringing up reinforcements to the Iraqis, was attacked from the air. The encampment was completely cleared of the enemy, who lost heavily in killed and prisoners, while the losses on the British side were negligible. Other aerodromes in the country which were in the hands of the rebels were also bombed, and the air arm of the Iraqi army speedily ceased to have any effective existence. The legitimate Government of the country, represented by the Regent, remains a good friend of Britain, as do all the surrounding Arab States.

A Gallant Record

While the campaign in Greece was still in progress little could be made public of the doings of the R.A.F. there, except brief records of raids and fights. It is still too early to tell the full story of that chapter of R.A.F. history, but part of it has been published by the Middle East Command.

When Italy attacked Greece last October, some of the R.A.F. squadrons who had been fighting for six months in the Western Desert moved at once to Greece. This was a small force, but even then it was too big for the few aerodromes in Greece. As new bases were built, the R.A.F. in Greece gradually increased, but never approached anything like the strength of either the Italian or the German air forces operating against Greece.

Only six days after Italy commenced her ill-fated march into Greece the R.A.F. carried out its first bombing raid. In many cases, during those first few days, pilots arrived with one or two members of the ground crew and between them prepared and flew their aircraft against the enemy until the rest of the personnel arrived by sea.

It was a hard winter; flying conditions experienced by our pilots were the worst in Europe. Nevertheless, enemy ports and aerodromes were consistently hammered to relieve pressure on the Greek Army holding their line in the mountains.

Early in November the first British fighter squadron arrived. Though only equipped with Gladiators, they immediately made their presence felt. On the day of their arrival in Greece the squadron carried out offensive patrols and, discovering the enemy in great force, shot down eight, as well

Sometimes during a raid the people on the ground in their blacked-out houses and shelters hear the sound of engines overhead while the guns are silent, and they smile and say to themselves, "Our fighters are up to-night," and they wish luck to the pilots who go questing through the night to take vengeance on the raiders. They wonder what it feels like to fight up there in the moonlight. The pilots seldom wax eloquent on their feelings on such occasions; their reports are usually quite matter-of-fact.

On one recent night three of the enemy raiders destroyed were shot down by one night fighter squadron. Two were destroyed within the space of two hours by a D.F.C. Squadron Leader. The D.F.C. Squadron Leader, who had two victories that night, did three patrols. He first attacked a Ju 88. "Suddenly," he said later, "there was a violent explosion as the Ju 88 blew up. As soon as I had refuelled and re-armed I went up again. This time I saw a raider and chased him, firing one burst and then another until the enemy went into cloud on

fire. I followed him down and gave him three more bursts when he came out of the cloud. By this time we were not more than about 500ft. above the sea, and as I pulled away I saw the raider diving into the water." This pilot has now 12 victories, 10 of which were during the daytime. "When I came down," he said, "I could scarcely believe that I had got two—it had all happened so quickly."

Iraq Revolt Smashed

IN Iraq the British authorities took prompt action. The Prime Minister has explained that when first more troops were asked for to guard communications there, there were none which could be spared, as all were wanted for General Wavell's force. But since the outbreak troops were sent to Basra from India, and reinforcements were hurried up to Habbaniya. When first that station was attacked, it was stated that most of the aircraft there were training machines, and the only guards were the Assyrian levies. Later we heard of fighters and bombers in action over

IR (Continued)

Music Hath Charms: Aircraftmen of the R.A.F. indulge in a little community singing on landing after the evacuation from Greece.

as damaging many others. This squadron accounted for more than 100 Italian and German aircraft before leaving Greece. February 28 was their greatest day. A small formation encountered successive enemy formations, and in an hour a drawn-out battle stretched the whole length of Albania. Twenty-eight enemy aircraft were shot down. Towards the end of the Greek campaign the squadron took part in a great air battle over Athens and shot down 20 German aircraft. At the finish of six months' arduous fighting, bombers of the R.A.F. in Greece had carried out more than 300 raids and nearly 300 aircraft had been confirmed as destroyed in the air, as well as a huge total of aircraft damaged both in the air and on the ground.

With the failure of the great Italian offensive launched in March and the Italian air force beaten to the ground, Germany came to her partner's rescue. It was not until our forces were evacuating that our pilots saw aircraft in the air again. With Yugoslavia unable to withstand the German onslaught, our bombers and the big Sunderland flying boats had another job to do—rescue of important personages from Yugoslavia, including King Peter.

Aerodromes Lost

WHEN the Army Commanders decided upon withdrawal to a new line, the R.A.F. suffered the most severe blow of the campaign. They were forced back to two or three bases only and the odd, temporary landing grounds they had used at the commencement of the campaign. All new aerodromes which had been built were lost, or were too close to the enemy lines to be used. The R.A.F. carried on, although the enemy hammered our few remaining bases continuously. It then became impossible to obtain replacement of aircraft. Those that did arrive were shot up on the ground. Nevertheless, aircraft, even though officially "unserviceable," took off all



the time and inflicted great damage to the enemy forces.

33 in One Night

ON the night of May 10th-11th, when the moon was at its zenith and there was not a cloud to be seen in the sky, a particularly savage raid was made on London. Casualties were high and a number of famous buildings, including the Houses of Parliament, Westminster Abbey, Westminster Hall and the British Museum, were severely damaged. In these conditions of utmost clarity our night fighters and ground defences excelled themselves. No fewer than 33 German bombers were destroyed during the raid, and of these 29 met their end at the hands of the night fighters. This brought the bag for the first ten days of May up to 124; thirty-three more than for the whole of the previous month, which was itself a record. From a battle such as this, where the onlooker could sense a tremendous spiritual resistance to stark terrorism, the fighter pilots had tales of wonder to relate.

One victorious fighter pilot reported: "As my bullets struck home the Heinkel was hidden in a shower of red sparks. I attacked again, a large explosion occurred inside the raider's fuselage and he went straight down."

This pilot has on four occasions destroyed two raiders in a night.

The pilot of a two-seater fighter which destroyed a Heinkel III over London reported: "After our second attack the bomber caught fire and made a spiral descent. Then a searchlight caught us both and we saw two of the Heinkel's crew bale out."

Another pilot who chased a raider back across the Channel shot it down off the French coast and afterwards saw distress signals from a dinghy which the German crew had launched.

Our offensive operations for the night included a particularly heavy raid on the docks and submarine building yards at Hamburg, with various targets at Bremen, Emden, Rotterdam and Berlin as secondary objectives.

The raid on Hamburg was a full-scale attack and even the German communique admitted that numerous fires and much damage was caused.

Gun Turret Work!

THE enemy defences were also busy and numerous air encounters took place in the brilliant moonlight. It is on such occasions that our policy of fitting power-operated gun turrets comes into its own, for although our bomber force numbered several hundreds, we lost only seven and it is certain that at least four of the enemy night fighters were destroyed. In addition to these operations, which were all carried out by Bomber Command, aircraft of the Coastal Command made their usual sweeps down enemy occupied coasts looking for supply vessels and other enemy craft. Bombers from the same command also attacked the oil stores and docks at La Pallice in the Bay of Biscay. The Coastal Command operations were without loss.

The week has seen a considerable increase in daylight activity by the *Luftwaffe* over this country.

ENEMY AIR LOSSES TO MAY 10th

	Over G.B.	Over Europe	Middle East (incl. Iraq)
May 4	10	—	25
" 5	10	1	5
" 6	13	—	6
" 7	27	3	1
" 8	26	2	5
" 9	5	1	—
" 10	33	4	14
	124	11	56

Total in Northern Area: 4,581. Middle East: about 1,508

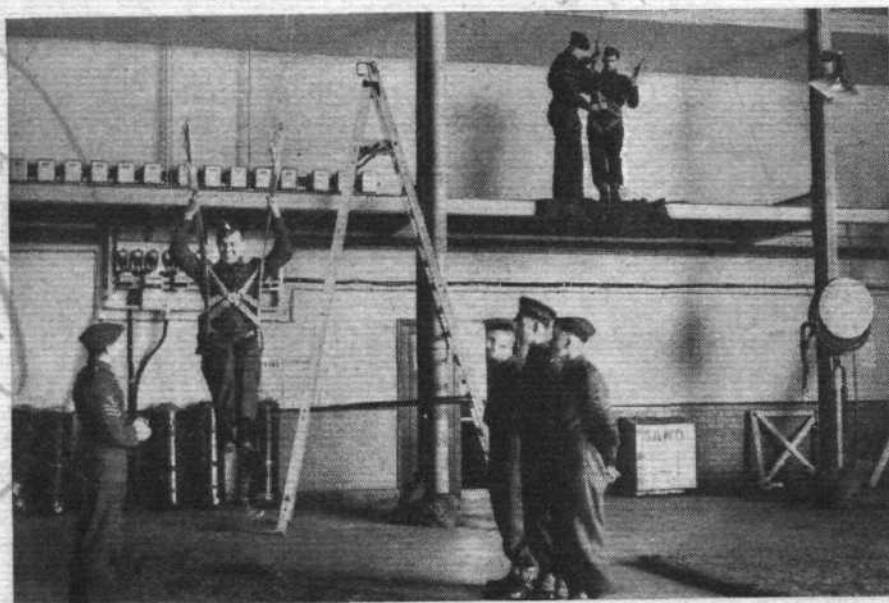
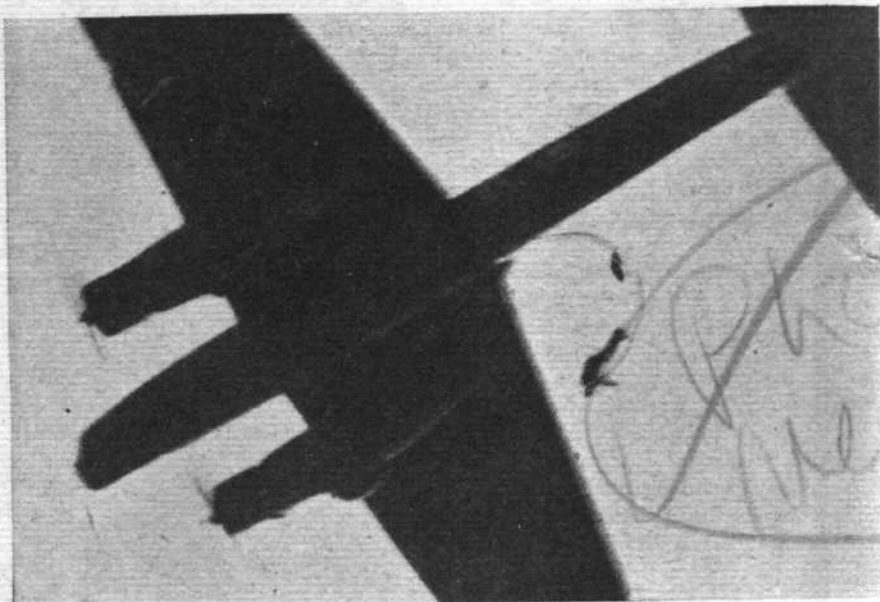
BRITISH AIR LOSSES TO MAY 10th

	Over G.B.	Over Europe and the sea	Middle East (incl. Iraq)
	Aircraft	Pilots	Aircraft
May 4	—	—	2
" 5	—	—	2
" 6	5	2	3
" 7	2	2	—
" 8	2	1	11
" 9	2	1	3
" 10	—	—	7
	11	6	26

Total in Northern Area: 1,946. Middle East: about 205.

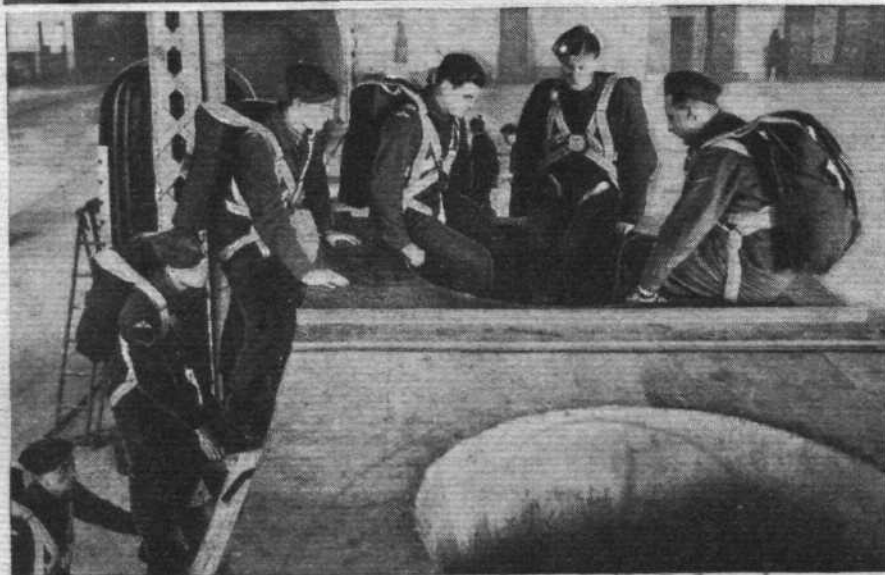
OUR AIR ARMY

Photographs of Britain's New Paratroops in Training



THE first indication that we had parachute troops already trained came with the announcement of their employment three months ago in the south of Italy. Photographs of their training are now released. A close-up of a single drop shows the type of canopy used and the emergence from the underside of the Tiger Whitley shows the "manhole" system is favoured by us in preference to the door in the side of the fuselage as used by the Germans.

The training commences with jumps from



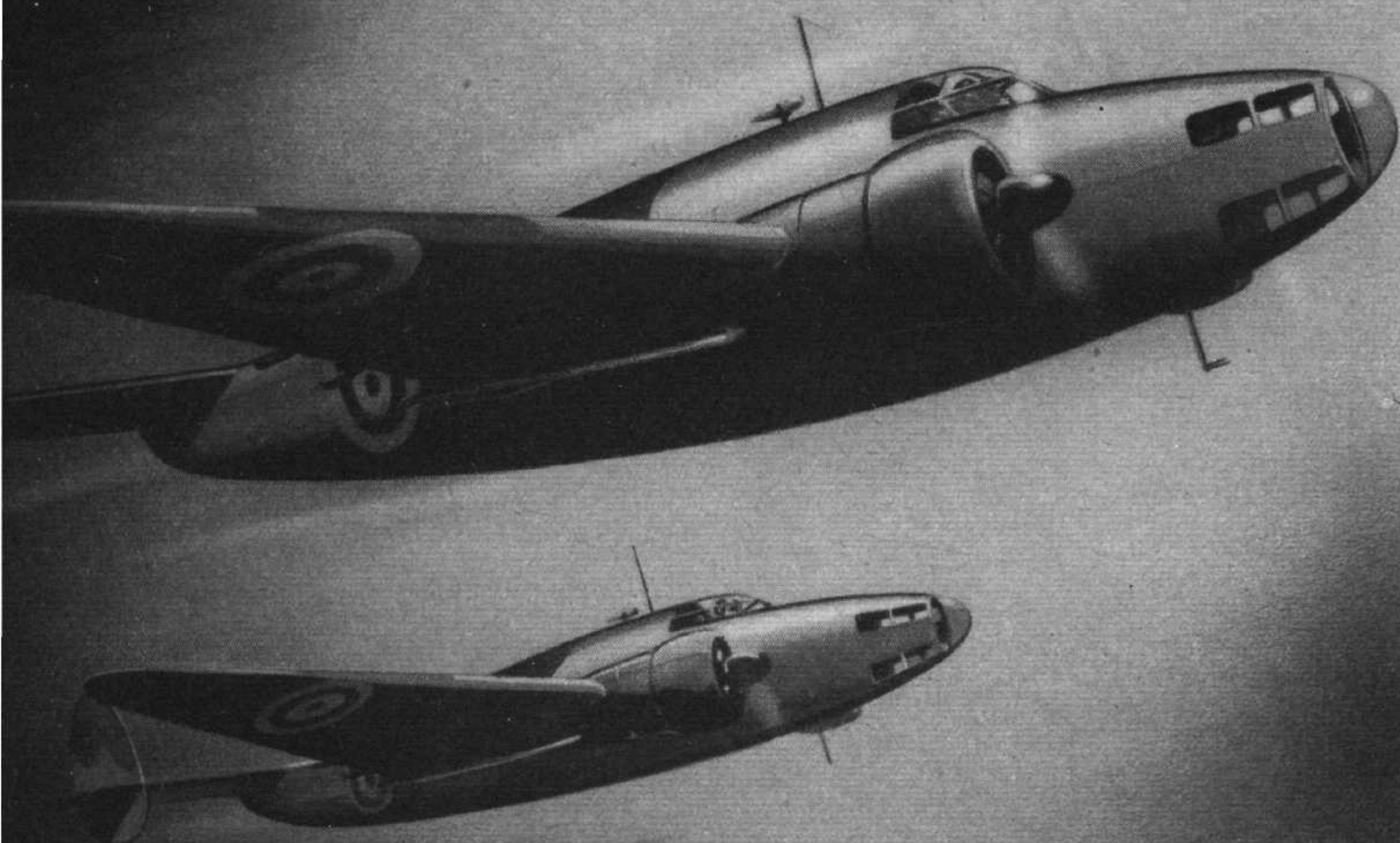
NIGHT AND DAY
Owlet
TRAINER

Flight, May 15th, 1941



Fully-equipped tricycle trainer
with dual instruments for blind
flying and night flying.





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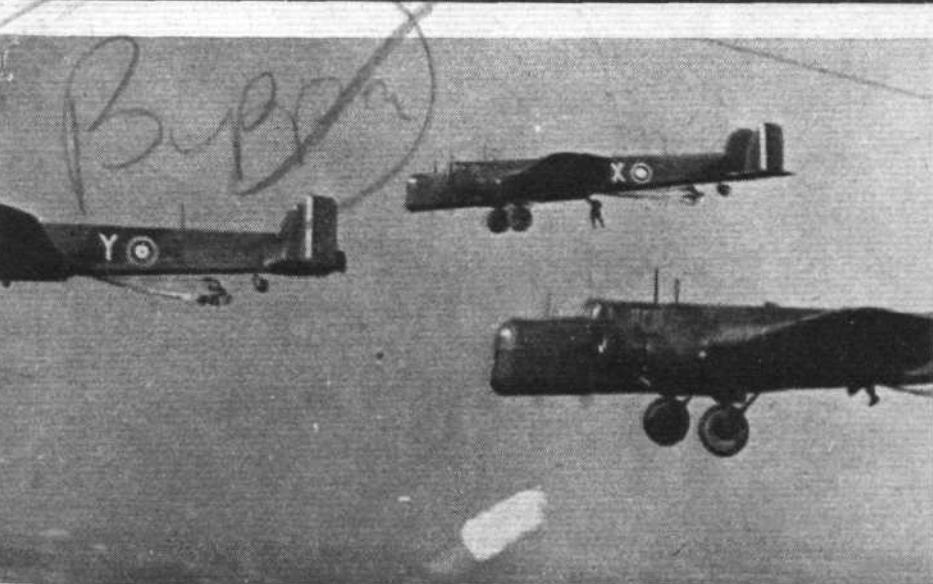
FLIGHT

May 15, 1941

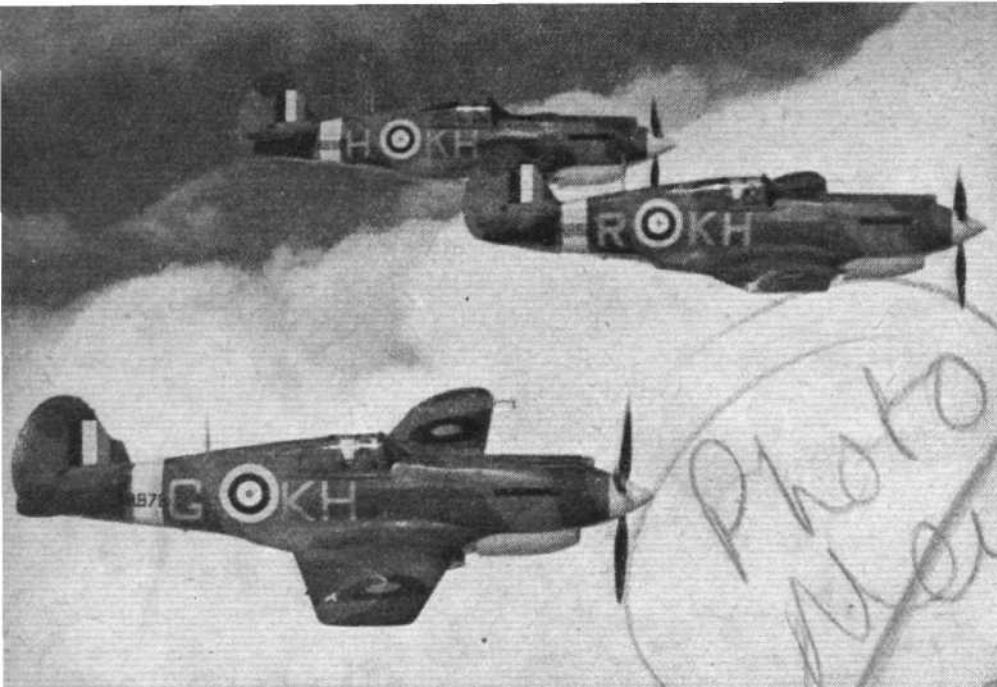
OUR AIR ARMY (Continued)

a ten-foot platform and dummy drops in a hangar through a mock-up "man-hole." At the bottom right-hand corner of the page is a worm's eye view of the parachutists grouped round the hole, ready to come out. In the air-training the new troops are shown boarding the Whitley and making simultaneous drops from three machines in formation.

Speed of opening is one of the most desirable



features in paratroop chutes, in order that low drops may be made to keep the men together. The group drops shown here indicate how good our canopy design is in this respect, and also how the landing is made in a nice compact bunch. Inspection will reveal that a certain number of the chutes support containers with supplies of food, arms and ammunition. In an actual operation the parachutes carrying supplies would be of different colours to make them easily recognisable.



2750

FLIGHT

THE AMERICAN

Some Interesting Comparisons

By J. I. WADDINGTON

"... One American fighter type which has been in the news lately is the Curtiss P.40, or describing it by its R.A.F. name, the Tomahawk."

WHEN I returned from the United States a week before war was declared I wrote for this journal a few notes on "American Methods and Modes" (*Flight*, September 21, 1939), recording points of interest which had struck me during a tour round various American aircraft and engine manufacturing plants.

The conclusions I had then reached were that the military needs of the British aircraft industry had brought the development of fighting aircraft and liquid-cooled engines to a point where they then led their American contemporaries by a comfortable margin, both in design, production and performance. I also anticipated that production in the States could be stepped up enormously in a comparatively short space of time, as they had there an abundance of labour and raw material. Extensive plans had

been made for considerable increase in plant and production, to cope with the increased demand expected as a result of the European tension and the war which was by then thought to be inevitable.

As regards military aircraft, there was little to choose between the two countries in workmanship or finish, but if there was any balance at all it was in favour of the American product. On the other side of the picture we had some way to go to equal American progress in air-cooled engines and in commercial aircraft.

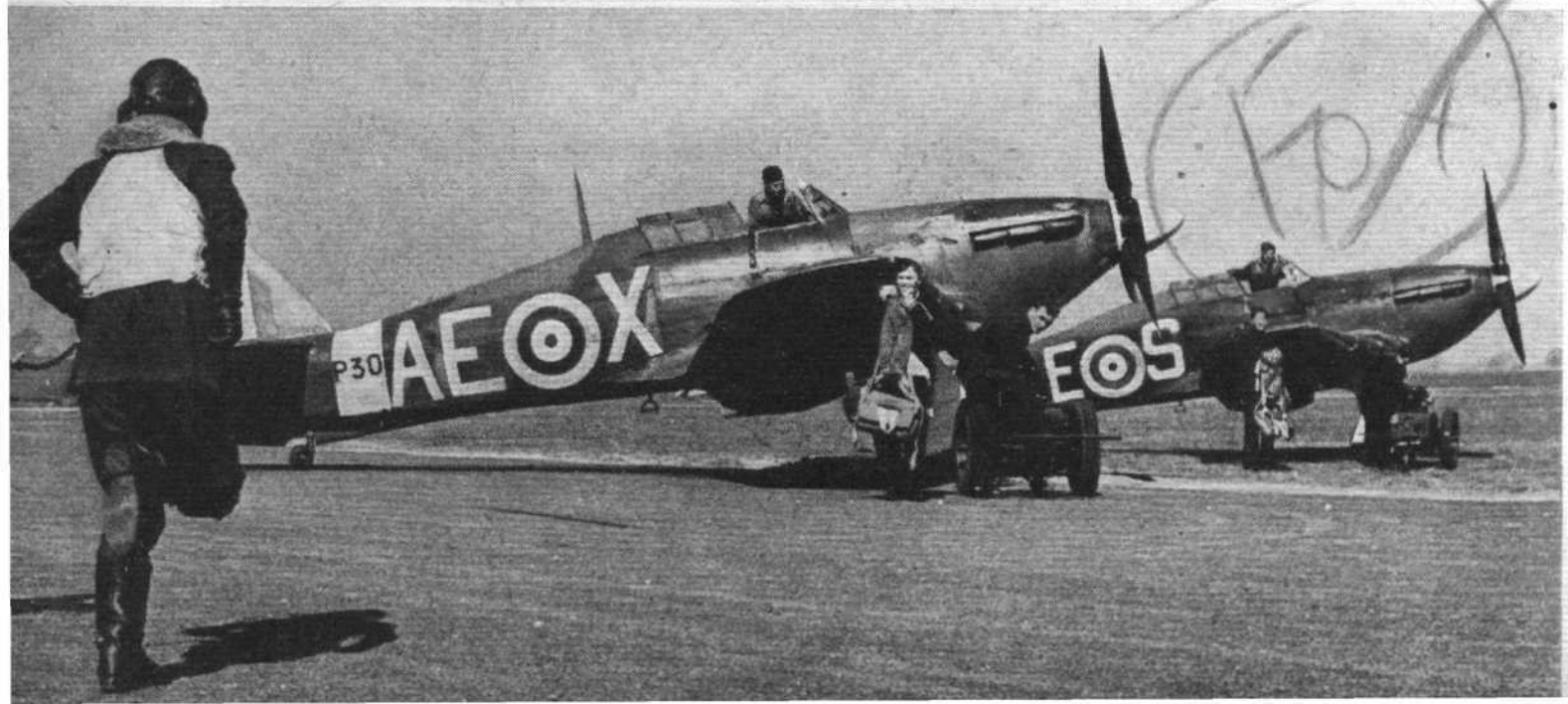
Those conclusions have been more or less confirmed by the experience which we have now had of American types—timely and generous aid which we have been receiving recently from across the Atlantic—but it has been a pleasant surprise to find that their fighter aircraft are not so far behind our own best, and that the gap is likely to decrease steadily and rapidly.

One American fighter type which has been in the news lately is the Curtiss P.40, or describing it by its R.A.F. name, the Tomahawk. This aircraft was in very limited production when I last visited the Curtiss plant, and its Allison engine had not reached any considerable degree of standardisation. This type of aircraft, which we have now in this country, has, however, reached a final form which is comparable with our own front-line fighters.

I recently had the pleasure of witnessing a mock combat between a Tomahawk and a Hurricane, and it augurs well for the later



"... in 1935, with the Hurricane (below) and Spitfire (left), the monoplane and the in-line liquid-cooled engine were wedded to the high-performance fighter."



CAN FIGHTER

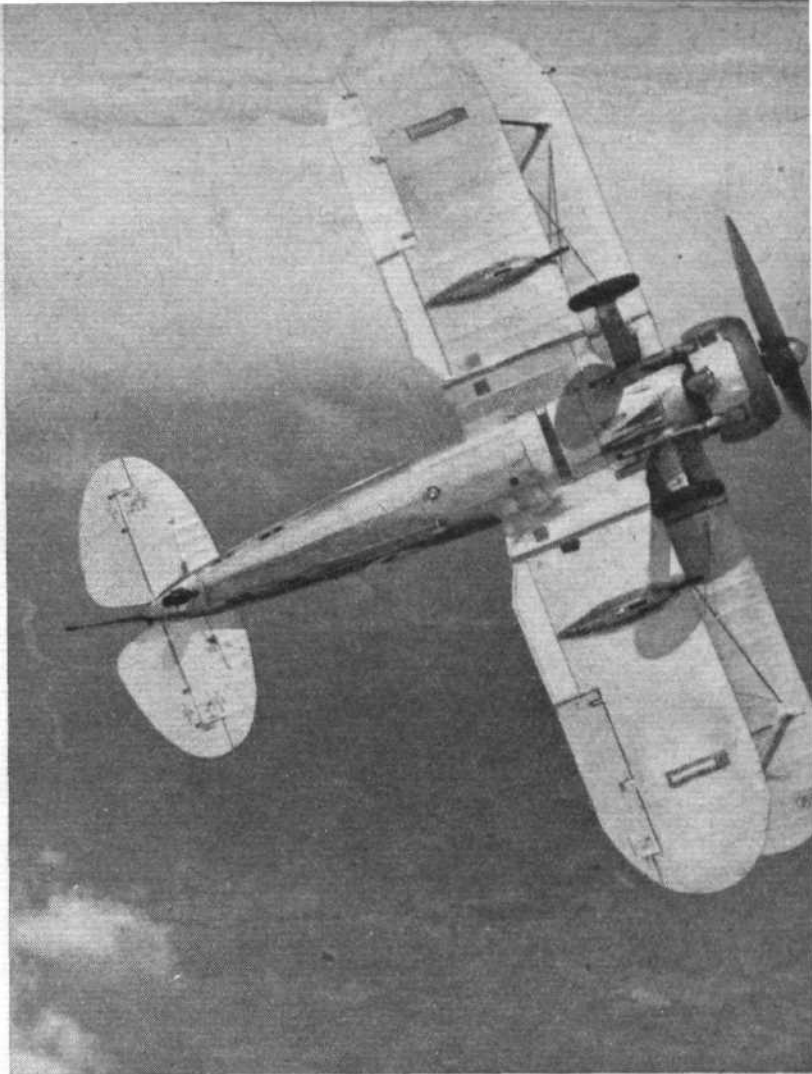
between the American and British Formulas

A. A. F. R. A. E. S.

types of fighters which the Americans are producing for us that the Tomahawk put up such an excellent performance when meeting this well-tried defender of our skies. At the altitude at which the combat took place there was very little to choose between the two types as regards speed and manoeuvrability, although the Merlin engine of the Hurricane would have shown to advantage at above 20,000ft. or so. The one considerable drawback to the Allison engine is that its rated power is at the relatively low altitude of 15,000ft. One thing in which the Tomahawk did shine, however, was its considerable rate of climb. This was quite exciting to observe, and must have been extremely embarrassing to its opponent. The *Luftwaffe* certainly is going to be embarrassed—to understate the case—when the new American types are ranged alongside our latest British fighters later in the year. More strength to Uncle Sam's arm and more "altitude" to his engines.

As I have mentioned above, the law of supply and demand has operated differently in this question of type development in Great Britain and in the United States. Civil demand over there necessitated the development of the larger passenger-carrying aircraft. Britain, with no such demand, had in her place a very urgent need for military types.

Thus the weight of American design was thrown into the creation of large, economical civil machines. These in their turn demanded the radial air-cooled engine with its comparatively simple maintenance and its adaptability to the large climatic changes encountered in Continental



"... On the question of armament, we had again a considerable lead when, in 1935, the four-gun Gladiator was put into service in the R.A.F."

operations. We, on the other hand, wanted fighters and the liquid-cooled engine of small frontal area and high performance for their power units.

On bomber and reconnaissance types the American civil experience has helped them considerably. We have very little to teach them in the way of basic design, but in fighter aircraft our well-developed technique will be of great use to the Americans in bringing their types up to the performance and operational standards required by our Royal Air Force.

Getting down to the question of fighter aircraft, we have established the present successful formula of a low- or mid-wing monoplane with liquid-cooled engine and heavy armament. Of these three characteristics the



"... in all American types now in production the fuselage inclines to be short and of a low fineness ratio... the effect of the radial engine with its large frontal area." (Above) The Grumman Martlet (Right) The Brewster Buffalo.



THE AMERICAN FIGHTER (Continued)

(Below) "... the Skyrocket. This is a completely new type of very unconventional appearance, having two engines set well inboard, and the fuselage nose cut off short. . . ."

Key Stone

(Above) "... The Bell Caribou . . . is a combination of at least two unorthodox and very interesting deviations."

Americans were ahead of us in developing one, i.e., the monoplane.

In this we see an incidental influence of American civil design, for there they had successfully used the stressed-skin type of monoplane for a considerable time, and had developed aerofoil sections of efficient aerodynamic and structural shape. As early as 1932 two American fighter aircraft having the monoplane system were in service with the U.S. Army Air Corps. These were the Boeing P.26 wire-braced monoplane, which with a 500 h.p. engine recorded a speed of 231 miles per hour; and the Curtiss A.8 Shrike two-seater fighter with a 600 h.p. Curtiss Conqueror D.12 liquid-cooled engine.

Another influence on this early development of the monoplane for service use was the interest which had been taken in high-performance monoplane racing aircraft such as the Gee Bee of 1930 which, with a 535 h.p. Wasp Junior, had a speed range of 80 to 284 m.p.h. The Curtiss-Wright, with its liquid-cooled in-line engine, represented as it were a prototype of the present formula, but unfortunately that type of engine was allowed to die out in the States, and the ubiquitous radial took its place.

Although this article is not intended as a comparison between the development of fighter aircraft in the United States and Great Britain, certain comparisons will prove interesting. At the time of the P.26 and A.8 our standard

fighters in this country were the Bulldog (which gave 170 m.p.h. on a 450 h.p. engine) and the Hawker Fury, giving 207 m.p.h. with 480 h.p. engine. These figures bear close comparison with the pre-1932 standard American pursuit ship, the Curtiss XP.22, which had been derived from the Schneider Trophy racers of 1921-22. This machine was the usual unequal-span, staggered and wire-braced biplane, with a speed of 205 m.p.h.

This was a critical period in fighter development, and it was at this time that the Americans, thanks to their use of the monoplane, began to exceed our fighter performances. The issue was only finally decided in our favour when, in 1935, with the Hurricane and Spitfire, the monoplane and the in-line liquid-cooled engine were wedded to the high-performance fighter as we now know it. Thus we established a lead over American contemporary types which we are still holding, thanks to the fact that, until the very recent development of the Allison, the United States Air Arms were dependent on radial engines which, however efficient, could not compete with the Merlin.



"... Another unconventional type from an old factory is the Lockheed P.38 Lightning, a twin motor single-seater fighter."

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AFTER VICTORY

FLIGHT, MAY 15TH, 1941.
ADVT. VI



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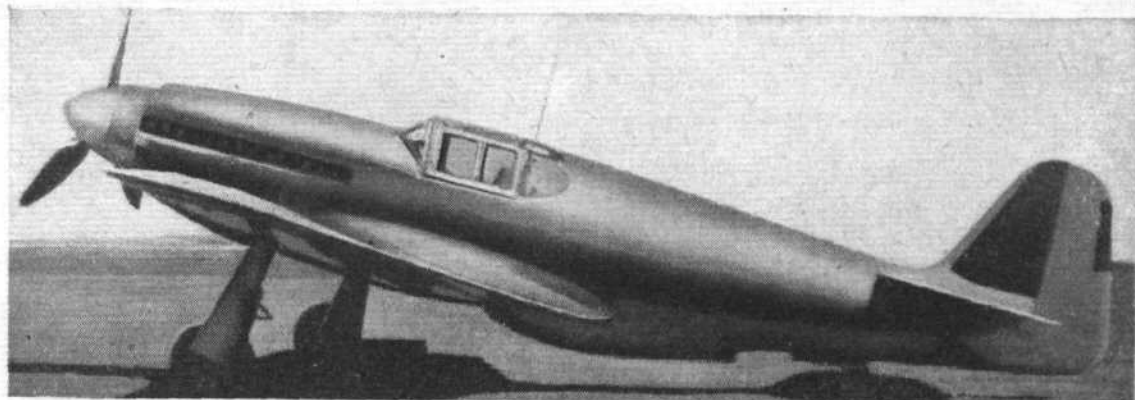
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THE AMERICAN FIGHTER (Continued)

"... such as the North American Mustang ... one of the nicest-looking aircraft which we are due to receive from an American factory."



On the question of armament, we had again a considerable lead when, in 1935, the four-gun Gladiator was put into service in the R.A.F., whereas the standard armament for the American military aircraft was, until very recently, two fuselage-mounted guns firing through the airscrew disc. Again, in 1938, when the Hurricane and Spitfire were introduced, firing power was increased considerably by the introduction of the eight-gun fighter. Another important innovation that year in our fighter development was the introduction of the retracting undercarriage in which we had again followed American practice.

It will be interesting to trace the development of the individual types of American fighter which are now coming to us, but as a preface to that there are several main characteristics about them in general which can be discussed.

Type Comparisons

When one compares the modern British fighter with the American, one is struck by the completely different lines of the fuselage. In the case of the Hurricane and Spitfire this is comparatively slim, whilst in all American types now in production the fuselage inclines to be short and of a low fineness ratio. There appear to be several influences at work in defining this shape. The most obvious is the effect of the radial engine with its large frontal area. Two other, less obvious, influences would seem to be the result of the experience gained from the very short and tubby racing aircraft of the Gee Bee type. Thirdly, there is the effect of the development of belly-retracting undercarriages. This type of retraction has been practised very successfully by Grumman, Brewster and Curtiss for some years.

Later types of American fighter, such as the North American Mustang, have lines obviously inspired by the British formula and rendered possible by the use of the Allison engine. This aeroplane is, incidentally, one of the nicest-looking aircraft which we are due to receive from an American factory.

The Bell P.400 Caribou, designed and produced by the Bell Aircraft Corporation, has no particular line of development, but is a combination of at least two unorthodox and very interesting deviations from accepted practice; it combines a tricycle undercarriage with a 1,000 h.p. Allison liquid-cooled engine which is mounted in the fuselage aft of the pilot's cockpit and drives the airscrew through an extension shaft. Over and above the advantages of the tricycle undercarriage, which are now pretty well established (all American specifications nowadays give tricycle as a preferred system), the location of the engine allows of very easy maintenance, and the nose of the aircraft can be designed to give a very good entry for the slipstream and extremely good visibility for the pilot both on the ground and in the air. The advantages and possible disadvantages of the tricycle undercarriage have been discussed at great length, and need not be gone into here, except to mention its desirability for landing on bad aerodromes, or where space is limited and air conditions difficult. This should be a very useful aeroplane if it approximates to the specified speed of about 400 m.p.h. at 15,000ft.

The Brewster Buffalo, which was on show at a recent inspection of American aircraft types, is a very attractive little aeroplane. It shows the characteristic tubbiness required by the radial engine, and a belly-retracting undercarriage. This undercarriage is a very neat and robust piece of work, although the air flow over the inner leading edge of the wing, with the undercarriage down, must be rather peculiar, since the fairing for the radial arm of the undercarriage conforms to the contour of the underside of the wing and, when not retracted, leaves quite a gap, starting just below the node of the leading edge. The undercarriage operation is very simple, and allows of quite a wide track. Pilots who have flown this machine say that it is extremely pleasant to handle and that it possesses quite a good turn of speed. This aircraft has had only a short line of development, having been evolved from the first Brewster type 138 (a two-seat scout bomber monoplane).



"... On bomber and reconnaissance types the American civil experience has helped them considerably." The Douglas Boston bomber which is also employed as a night-fighter under the name of the Havoc.

THE AMERICAN FIGHTER (Continued)

(Left) A special version of the Vultee Vanguard with an experimental radial engine of 1,600 h.p.



(Right) "... the Vanguard, again of American formula and of which very good handling reports have been heard."



which was followed by the F2A-1 single-seat monoplane ship fighter.

The Curtiss Aeroplane Division is providing us with two main types of fighter at the moment: P.36-Mohawk and P.40-Tomahawk. This company is one of the oldest in the States, and these aircraft have a well-marked line of development which has changed gracefully and soundly from the older biplanes of the XP.22 type into the monoplane Hawk 75, from which the P.36 was derived. This aeroplane is remarkably manoeuvrable, has a very good climb and a good top speed for a radial-engined aircraft. Without any material fuselage modifications, this aircraft developed into the P.40 by the introduction of the Allison engine. This retained the tried features of the older type whilst improving climb and top speed by the introduction of the more powerful in-line engine. A further development of this type, and one which we have not yet seen in this country, is the P.46-Kittihawk. This is understood to be a smaller, lighter aircraft with greatly improved armament and a more powerful engine. The Kittihawk, again, is in the 400 m.p.h. class.

Unconventional Fighters

Another type which bears a strong resemblance to the Brewster Buffalo is the Grumman Martlet, a single-seat fleet fighter which has the same general shape and arrangement, but with a different system of undercarriage retraction. This still retracts into the belly of the aircraft, however. The Martlet, since its arrival on this side, has been highly praised for its handling and general performance which are superior to anything in this class we have had so far in the Fleet Air Arm. This type has been developed from aircraft produced by the Grumman company during the last ten years. These have been divided into amphibian and ship fighters. Until the Martlet the fighters were all biplanes, but the fuselage shape and retraction principle are very similar in both monoplane and biplane. The Martlet has been designed for rapid and easy production, and I had the pleasure of seeing trials of the prototype when I was at the Grumman plant during my visit to America in the summer of 1939.

Another ship-type fighter produced by this concern is the Skyrocket. This is a completely new type of very unconventional appearance, having two engines set well inboard and the fuselage nose cut off short aft of the leading edge

of the wing. It is rumoured that the prototype has not been entirely successful and is undergoing radical modifications.

Another unconventional type from an old factory is the Lockheed P.38 Lightning, a twin-motor single-seater fighter. This aircraft, of twin-boom construction, has no forerunner in the American type fighter, but it bears a strong resemblance to the Fokker G I, which presumably inspired the P.38 design. The Fokker, of course, differed in that it had radial Mercury engines. The Lockheed also has the tricycle undercarriage arrangement, and it is well armed with cannon and machine guns. This aircraft, like the Bell and the Brewster, uses the mid-wing arrangement.

The North American Aviation Company have been previously concerned with the design of medium-sized and trainer aircraft, although they did produce one radial-engined fighter, the NA.50. In the NA.73 Mustang, however, they have obviously developed along British fighter lines, and have produced an aircraft which looks well and which should perform creditably when given to the R.A.F., as the top speed is reported to be round 400 m.p.h.

The Republic Lancer comes from the concern which used to be known as Seversky. This firm started production on amphibian aircraft. Then, in 1938, it received an Air Corps order for P.35 single-seater monoplanes, from which the Lancer was developed. This aircraft has no outstanding features but conforms to the common American type of short, fat fuselage with radial engine.

Vultee's are producing for us two promising types; the Vanguard, again of American formula and of which very good handling reports have been heard; and the Vengeance dive bomber now in production and understood to be an Allison-engined version of the Vanguard, and which will again possibly be in the 400 m.p.h. class. This is the first fighter aircraft which Vultee's have produced, but this firm have an established reputation in the larger civil market and in medium sized military types.

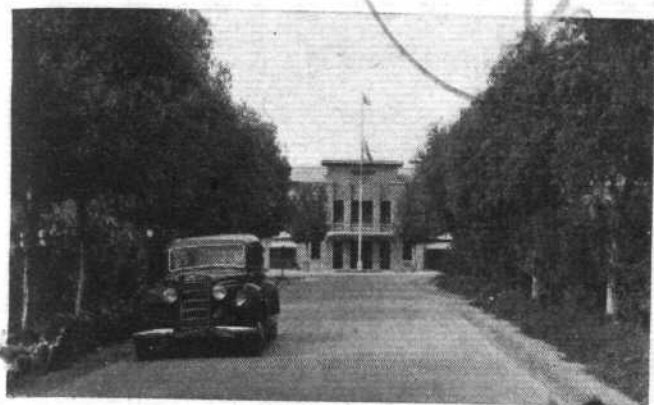
Just as wars and threats of wars have accelerated British fighter development, so will America's participation in our war effort produce new and better fighter types, in the design of which our experience will doubtless be used to the full. In a very short time I expect that our designers will have to look to their laurels if they are to keep as far ahead of their friends across the Atlantic as they have kept ahead of their enemies across the North Sea.

75

FLIGHT, May 15th, 1941.

WAR in IRAQ

Photographs of Habbaniyeh



At the top of the page is the R.A.F. headquarters at Habbaniyeh, which, incidentally, has been built on virgin desert, and the flying-boat base on Lake Habbaniyeh. This base is used by British Overseas Airways, and the building in the foreground is a hotel specially built for the accommodation of air passengers.

In the centre is the R.A.F. aerodrome at Habbaniyeh where hostilities broke out between British and Iraqi forces.

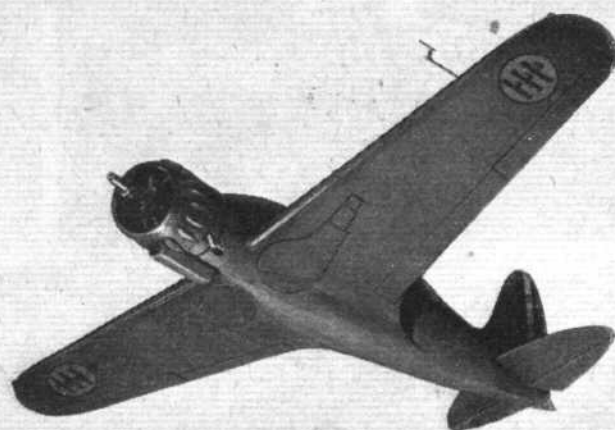
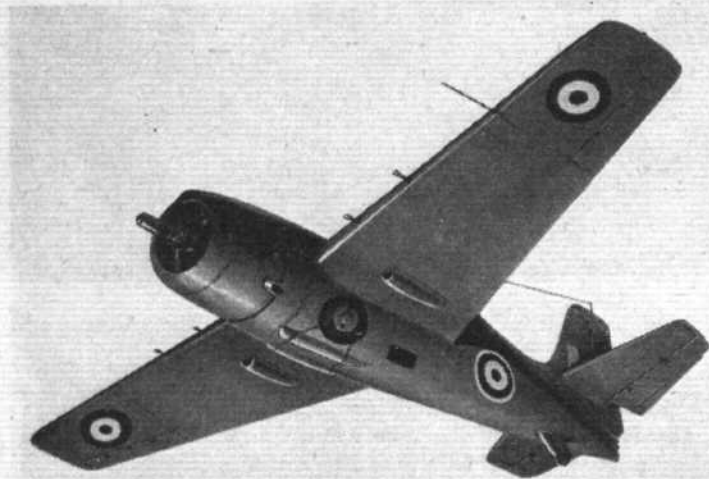
The picture at the foot of the page shows the native cantonment of the R.A.F. Station at Habbaniyeh. Native workmen employed at the station are housed with their families. This area was one of the targets of the Iraqi forces.



Nineteenth of the Series

FRIEND or FOE?

Two Fast Single-seater Fighters : Grumman Martlet and Macchi C.200.



Grumman Martlet. Mid-wing, tapering trailing-edge, square tips, dihedral from roots. Large radial engine faired into deep, rounded fuselage. Wheels retract into fuselage. Cockpit fairing curves into leading-edge of fin. Square-cut tailplane with tapered leading-edge

Macchi C.200 Low-wing, slight uniform taper to both edges, rounded tips, dihedral from roots. Radial engine with helmeted cowling. Humpbacked fuselage with pointed tail; short cockpit fairing. Wheels retract inwards. Elliptical tailplane; rounded apex to fin and rudder.

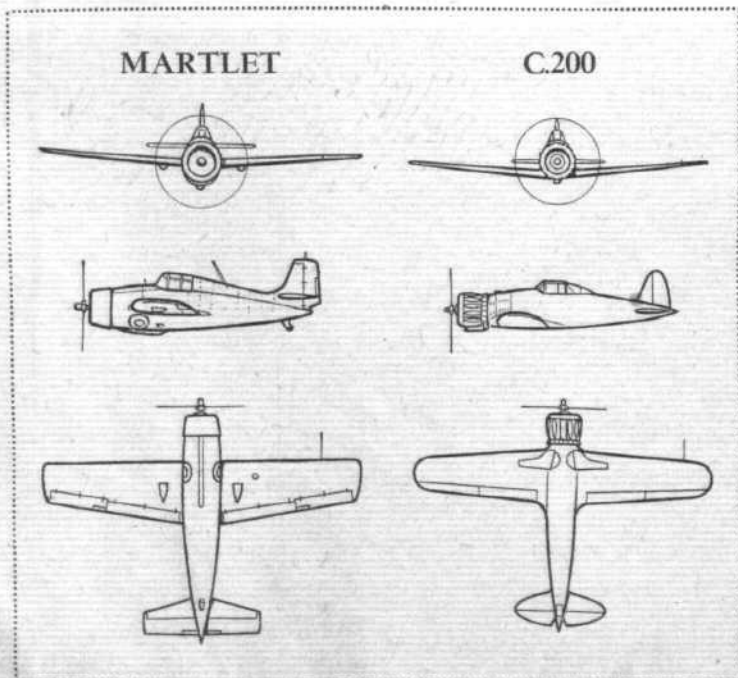
ONE of the latest of America's single-seater fighters, or "pursuit" planes as they are known in their native country, the Grumman Martlet, has already gained full marks in operation with the Fleet Air Arm. Its general lines are characteristically American, with its large radial engine giving it a blunt nose and tubby-looking fuselage. Its neatly enclosed cockpit, however, is faired off right back to the fin, this fairing forming a sort of ridge along its back and curving smoothly up into the leading-edge of the fin itself. Its mid-wings, which have dihedral from the roots, taper on the trailing-edge only to perfectly square-cut tips. The tailplane is also square-cut, tapers on the leading-edge and is mounted on the lower part of the fin and not on the fuselage, the rudder extending down between the elevators. The wheels fold up into the belly of the fuselage in the manner developed on the earlier Grumman biplane fighters. When in the down position for landing, the Martlet undercarriage is not quite so wide as that of the somewhat similar-looking Brewster Buffalo, and has been found to place rather a premium on precise landing technique on anything but a smooth surface such as the concrete runway of the usual American aerodrome or the deck of an aircraft carrier. The Fleet Air Arm, however, invariably provides the latter, and F.A.A. pilots have expressed complete satisfaction with the handling of this machine and its excellent performance.

Bearing much the same relation to Italy's record-breaking seaplane as the Spitfire does to the Supermarine S.6, the Macchi C.200 is the fastest stan-

dard fighter of the Regia Aeronautica. But although it is said to be in full production it has not yet been encountered in anything like such numbers as the Fiat C.R.42 and G.50.

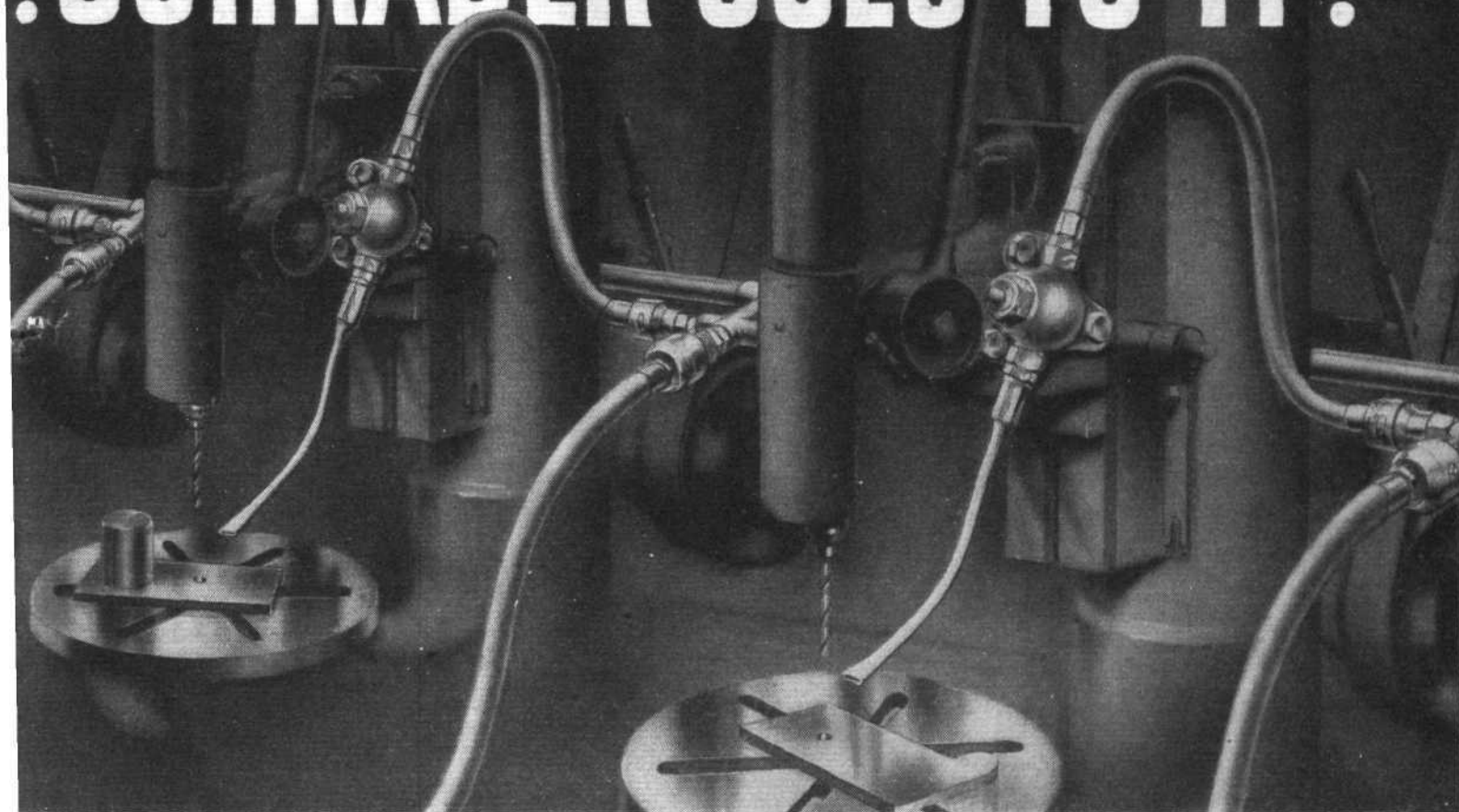
Its wings have a small degree of uniform taper on both edges, generous fillets at the roots and symmetrically rounded tips. Its radial engine has a boldly helmeted cowling but makes rather a poor line with the fuselage, which is decidedly humpbacked (like the Fiat G.50). This characteristic is further emphasised by the shortness of the cockpit fairing, which curves abruptly down on to the back of the fuselage. The legs of the undercarriage are set wide apart and retract inwards beneath the centre-section. The cantilever tailplane is elliptical and the fin and rudder, of comparatively high aspect-ratio, slope on both edges up to a small, rounded apex. Types previously described:—

- (1) Hurricane and Me 109.
- (2) Spitfire and He 113.
- (3) Beaufort and Ju 88.
- (4) Lysander and Hs 126.
- (5) Hudson and Me 110.
- (6) Anson and Fw 187.
- (7) Hereford and Do 215.
- (8) Blenheim IV and He 111K.
- (9) Skua and Ju 87B.
- (10) Swordfish and Ar 95.
- (11) Sunderland and Do 26.
- (12) Gladiator and Fiat CR 42.
- (13) Bombay and Ju 86K.
- (14) Buffalo and Fiat G.50.
- (15) Wellington and Fiat BR 20.
- (16) Liberator and Concor.
- (17) Whitley and Ju 52.
- (18) Lerwick and Do 24.

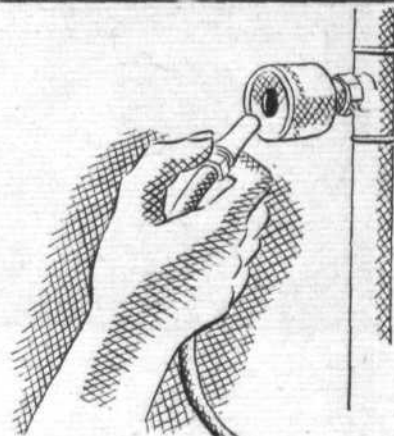


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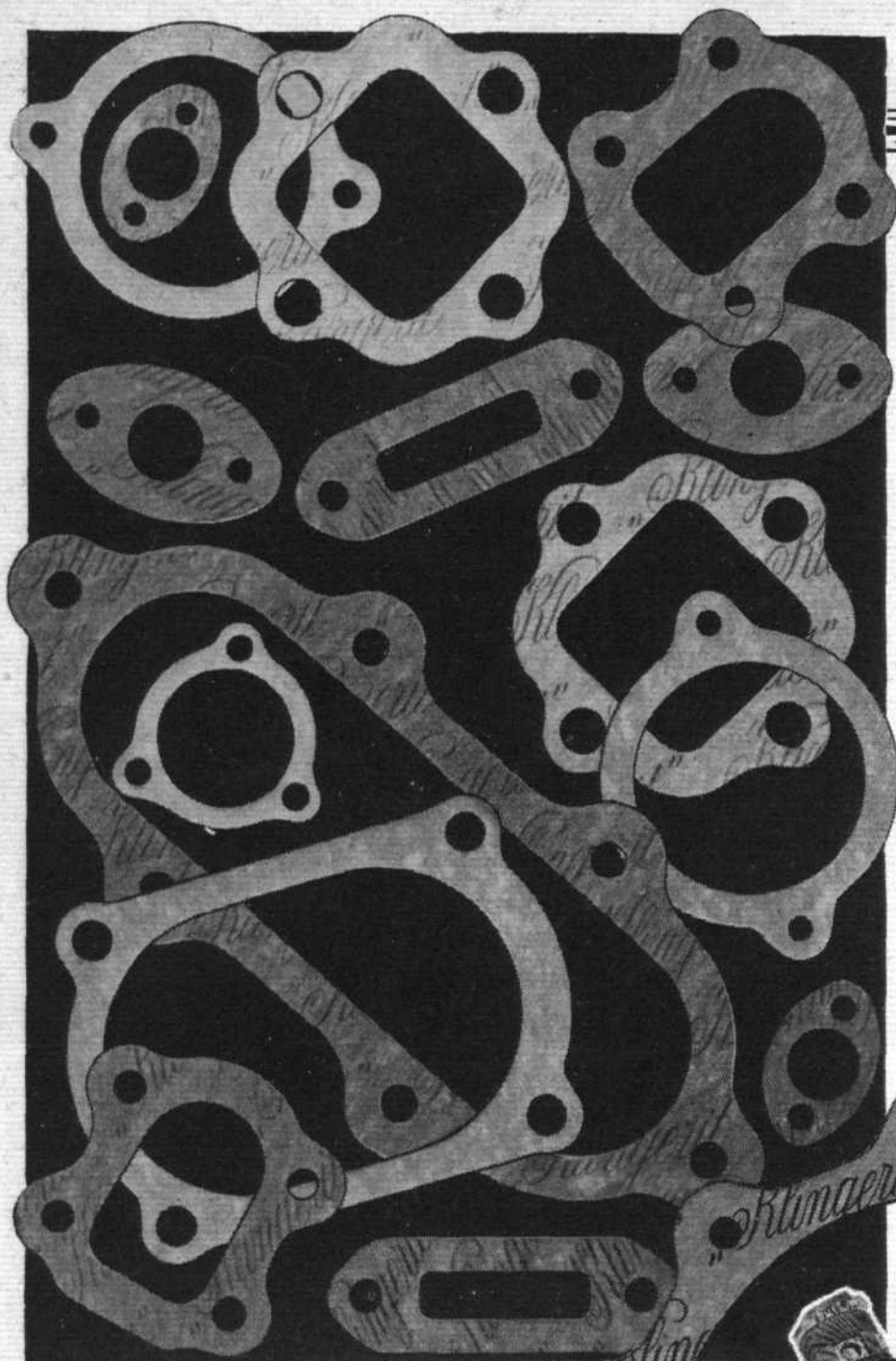
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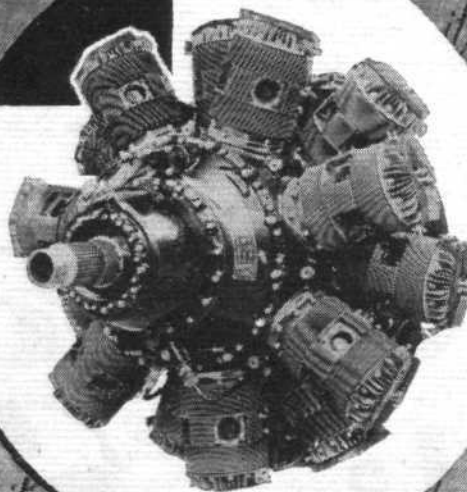
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CIVIL AVIATION in AUSTRALIA

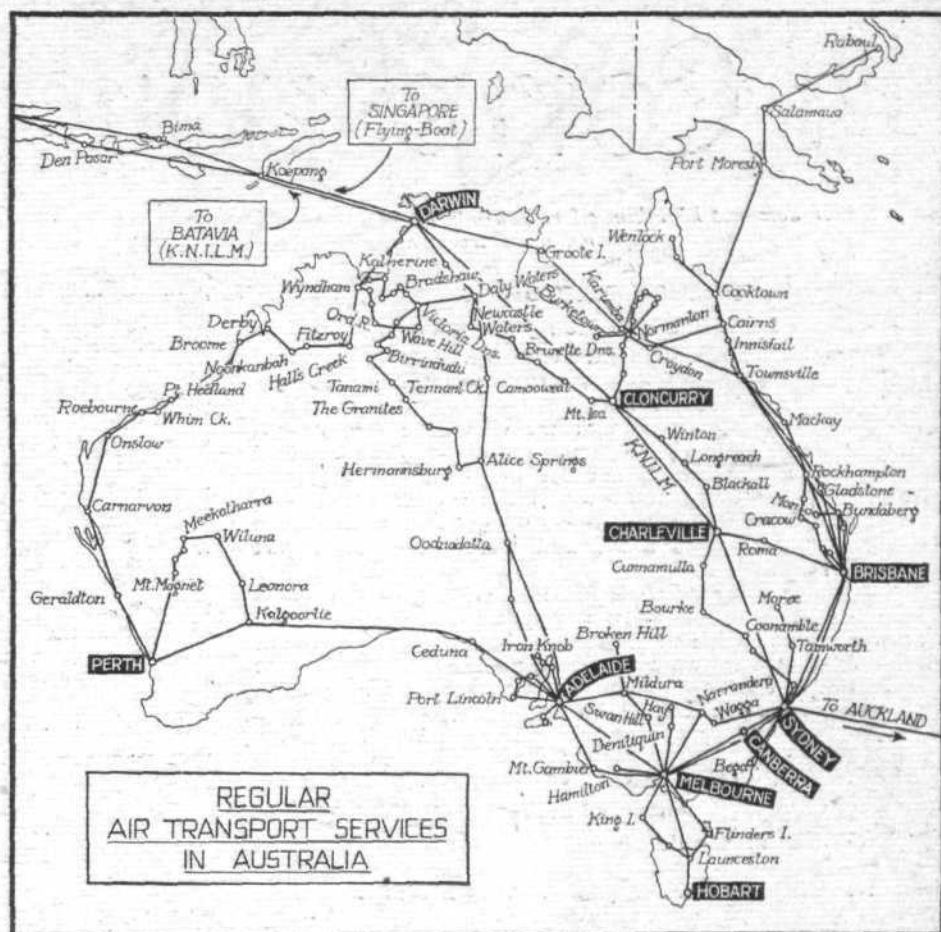
*Its Wartime Importance :
Efficient Development with
Small Financial Aid*

THE report on civil aviation in Australia for the year ended June 30th, 1940, shows that this form of transport is proving its great value in wartime as it did previously in peace. It has provided a means for the speedy movement of industrial executives concerned with manufacture for war; it has put its meteorological and radio services at the disposal of the Royal Australian Air Force, and its elementary flying training schools and clubs have been a nucleus on which similar schools of the Empire Air Training Scheme have been built. But most important of all, it has provided a large number of aerodromes over the enormous area of Australia without which the efficiency of the R.A.A.F. would be seriously curtailed. And as Mr. Corbett, Director-General of the Civil Aviation Department, whose term has been extended for another year, writes: "The building up of Australian civil aviation organisation . . . has cost some £2,000,000 in all." That is all the sum is; enough to keep this war going for one-sixth of a day, about four hours. Total civil aviation expenditure for 1939-40 totalled only £483,000 for ordinary services and administration and £339,000 for new works.

The Year's Achievements

The accident rate is a noteworthy part of the report, for there were no fatal accidents on the regular scheduled services. In all other civil flying there were only 10 pilots and 12 passengers killed, an analysis showing that 72 per cent. of all accidents were due to "pilot trouble." Some of the Qantas Empire flying boats and the Douglas DC 3s of Australian National Airways were seized temporarily for military work, the Douglasses being on convoy, but have since been returned. This is part of the reason for the drop in aircraft-miles to 8 million from the 9½ million of the previous year. It is significant, however, that the total of passenger-miles has risen from 43 to 49 million, showing that more efficient use is being made of the aircraft as the load factor is higher. Unavoidably the weight of mail carried by internal and Empire services has dropped from the 1,399,000 lb. of 1938-39 to 848,000 lb. of 1939-40. This is because the Empire air mail scheme has had to be dropped and the surcharge raised to 1s. 6d. per ounce. The surcharge collected on these mails by the Post Office is credited to the Civil Aviation Department at the rate of 9s. 6d. per lb. for internal services, 11s. 4d. for the Trans-Tasman and 52s. 6d. per lb. for the Empire service to England. Surcharge totalled £81,000 for the internal and £157,000 for the overseas routes, these amounts being an offset against the mail payments paid to the companies to run the routes which were £253,000 and £128,000 respectively.

Notable achievements during the year were the establishment of the Trans-Tasman flying boat service with *Awarua* and *Aotea* in May, 1940, the bringing of Dilli in Portu-



guese Timor on to the Empire Route, the military modification of civil aircraft by the aeronautical engineering staff of the Department, the reconstruction of one wing, nacelle and undercarriage of a Douglas DC 2 by Australian National Airways, the flying of 95,000 miles on medical missions by the six flying doctors, and the completion of the radio beam path from Brisbane to Melbourne, Hobart and Adelaide.

Aircraft on the Australian register at the end of the year totalled 332, with 261 of these in possession of a current certificate of airworthiness. Importations for the year were not important, the only aircraft over 10,000 lb. loaded weight being two DH. 86s and two Lockheed 14s. The remainder of the 25 British and nine American were all small craft. Indicative of the increasing aeronautical engineering control exercised by the Department is the fact that 51 firms are now licensed to manufacture aircraft material or parts, and 36 to issue certificates of repair.

Very complete statistics are given of the services, distances, aircraft, mail payments, passenger-miles and average passenger loading (which works out at 6.1 for all services). There is, however, one weakness, the percentage load factors are not given. Without this one cannot assess the efficiency of the use to which the aircraft are being put on the airlines and it is not possible to measure progress accurately. American statistics are a model in this respect.

The Government-assisted aero clubs flew a total of over 24,000 hours for the year for the instruction of 317 A licence pilots. Unassisted schools taught 255. Current A licences are 1,225 in number, with 324 commercial B licences and 651 ground engineer licences. Navigators' licences total 85, flying instructors' 87 and radio-telegraph operators' 92. There are 224 licensed aerodromes in Australia.

The enterprising airline companies of Australia and the Civil Aviation Department have done good work on a very small amount of money. No doubt they will do as well in the future, but it is hoped that civil aviation will receive its due recognition and a suitable monetary stimulus from the Commonwealth Government. Civil aviation is concerned primarily with peaceful development, but those who have said that it has a great wartime usefulness have now seen their words vindicated to the full.

Correspondence

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

FRENCH FACTORIES

Legitimate Bombing Targets

THE position of the Vichy Government, French Fleet and the French attitude in North African possessions is causing the Government grave concern.

Some of us in the motor industry who have seen French mass-production industries in motor and aircraft, are at a loss to understand why we do not use our bombers to greater advantage nearer home and without the long-distance flight risk. I give below an extract from an American business news magazine, which proves this contention. (This paper just received):—

"Germans are extracting a larger volume of war goods each month from conquered France alone than the United States is producing and sending to England. The Germans are obtaining more warplanes each month from the aircraft industries of France, Holland and Belgium than England is obtaining from the United States."

Coventry.

W. J. LORD.

THE FIRST COMPOSITE

Action of Flaps

EVERYONE interested in flying marvels at the fine standard *Flight* has been able to maintain despite wartime difficulties. There is just one small point I would like to raise, however.

Hundreds of people, like myself, regard *Flight* as the "Bible" of the technical Press—aviation's equivalent of *The Times* daily newspaper. I believe it is in *Flight's* interest, as well as that of the aeronautical world, to do everything to cherish and preserve that splendid reputation.

I know it is the practice of many daily newspapers to ignore small errors and not to call attention to them by corrections. In many cases this is justified. Spelling errors and many other small mistakes can be left to the reader's good sense.

In matters of historical importance, however, I hold that this is not so and I hope you will take up a couple of lines of your valuable space—yes, even in wartime—for the statement that the "Sopwith 1½-strutter" that Mr. Pemberton-Billing named as the upper component of Comm. Porte's composite aircraft, should, of course, have been a Bristol Bullet.

With regard to "Indicator's" interesting article, "Strange Interlude," in which he suggests that loss of height when flaps are raised is caused by a surge of air from behind the flaps "lifting" the airflow over the upper surface of the wing, my comment is that it is an intriguing suggestion but, frankly, I do not believe it.

In my humble opinion there is no need to apply such an involved line of reasoning when the answer is probably much more simple.

A lowered flap, while acting as a "wind-brake," actually adds to the total lift of an aerofoil by increasing the curvature of the under surface and adding to the compression of the airflow under that surface. At the same time it increases the

drag component because of the "vacuum" behind the flap. There is also a resultant lift component due to the suction behind the flap unless its "down" position is virtually at 90 deg. to the wing's under-surface. Raise the flap quickly and you decrease the lift suddenly, while at the same time reducing the drag. The addition to the aircraft's forward speed, however, does not quickly enough increase the wing's lift (via a faster airflow over both upper and lower surfaces) to compensate for the loss of resultant lift brought about by the raising of the flaps.

The aircraft, therefore, does actually sink and in sinking "leaves behind" the airflow over the upper surface (which has to be tight to the rear part of that surface for the lift to be maintained). It is at this point, possibly, that a surging of air from the under-surface over the trailing edge on to the upper surface takes place. This probably restores the wing to an unstalled condition.

My argument is that it is the actual incipient sinking that breaks the flow over the upper surface and not the mere airflow results consequent upon the raising of the flaps.

S. HOWARD BARNETT.

THE RUSSIAN DELAYED DROP

Terminal Velocity of Falling Man

I READ with interest the account of the high altitude delayed parachute jump of the Soviet parachutist, Polosukhin, and *Flight's* comment on the speeds attained.

In reading the statement I am convinced that *Flight* has misinterpreted the meaning of the 70 metres per second. My interpretation is that while a maximum speed of 102 m/s was registered (probably at a relatively high altitude) this had decreased because of the increasing density of the air to 70 m/s by the time he had reached the altitude at which he opened his parachute (5,000 feet apparently). This figure, approximately 157 m.p.h., then becomes reasonable and not too much out of keeping with the 120 m.p.h. commonly accepted.

As to the flimsiness of the evidence for the figure of 120 m.p.h., I am familiar with two sets of tests made; one in which a 180 pound dummy man equipped with simulated parachute pack and harness and a flare, was dropped at night from an airplane flying at an altitude measured by corrected altimeter. The path of the fall was recorded on the film of a camera, before the lens of which swung a second-pendulum. Calculations from this film indicated that in a drop from 3,000 feet the dummy reached a terminal speed of around 120 m.p.h. after a fall of approximately 1,200 feet. The speed varied somewhat, depending on whether the dummy was falling "spread-eagle," head first, or tumbling.

The second series of tests was made by timing similar drops from captive balloons at altitudes varying from 500 to 3,000 feet. Speeds calculated from these figures agreed fairly well with those of the other tests.

Elmira,

New York.

RALPH S. BARNABY,
President of the Soaring
Society of America, Inc.

Book Review

"Night and Fire Spotting," by Francis Chichester; George Allen and Unwin; 2s.

IF it were possible for the unaided ear of the spotter and fire-watcher to determine the position and direction of invisible hostile aircraft by engine sound at night, then this book would be as admirable as its predecessor, *The Spotter's Handbook*, by the same author. But the apparent direction of any sound, especially at night, is affected by so many considerations that without the aid of expensive apparatus it must always be utterly unreliable. Of what practical use, then, will be the many calculations and diagrams and the fascinating little gadgets which Mr. Chichester has devised for the application of this mathematical system of night-spotting, all of which depends on the spotter first locating the aircraft by sound?

Of the eight chapters in this book, all are very readable but

only one is of any real value to the fire-watcher—the one giving practical hints and tips on dealing with fire-bombs.

A First-rate Issue

THE May issue of *The Automobile Engineer* contains a detailed technical description of the new Bentley Mark V chassis, with many drawings and half-tone illustrations. Other features of a first-rate issue include a note on the more common causes of diesel crankshaft failures, developments in plastic bodies by the Ford Motor Co. of U.S.A., some practical notes on surface broaching; Clad Metals; Heat Treatment Plant and Body Contours. Automobile engineers will find interest in the review of the methods and equipment of John Holroyd and Co. as gear production specialists. Copies of *The Automobile Engineer*, price 2s. 6d., may be obtained by order from news-agents or direct from Iliffe and Sons Ltd., the publishers.

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THE RISING CURVE

Production and Export of U.S. Military Aircraft

IT is now possible to straighten out the confused figures which have been made available lately on aircraft production in the United States and to present a clear picture of just what has been accomplished and what is likely to be in the near future.

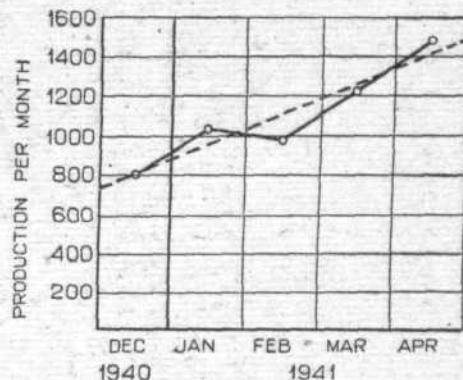
Recent figures for production of aircraft of military value (military craft and airline transports) are: December, 799; January, 1,036; February, 972; March, 1,216; April, 1,493. The graph gives a picture of this rising rate and it is an encouraging picture. The smoothed-out curve, the dotted line, shows that the monthly total has been increasing over the period in question at the rate of 150 per month; that is, each month's total is 150 higher than that of the preceding month. If maintained to the end of this year the production rate would then reach 2,700 per month, but this is probably too much to expect, for trainer types at present constitute the greater part of American output, a figure of 60-40 having been given for the proportion of trainers to combat types. As the call is for more and more bombers, which entail many more man-hours, the present expansion rate (in numbers) probably will not reach as high as 2,700 by December, 1941. We think that it is likely to be 2,400 by then.

Col. John H. Jouett, president of the Aeronautical Chamber of Commerce, estimates that a rate of 1,800 per month will be reached by September, but William S. Knudsen, director-general of the Office of Production Management, thinks that estimates of 1,500 to 2,000 per month by summer are too optimistic. It was Mr. Knudsen who expressed the opinion that both British and German production rates at present were at the 1,500 per month level, but we wish to point out that this figure for Germany disagrees very much with Mr. T. P. Wright's estimate of 2,200 for the "Axis Powers" (see *Flight*, February 27th, 1941, page 176). His estimate for current production in the United Kingdom is 1,750.

The industry has increased its productive floor area by 28 per cent. in the 59 days between January 1st and March 1st of this year. A total of 24,122,230 sq. ft. was in operation in aircraft, engine and airscrew factories on March 1st, as compared to 18,782,879 sq. ft. on January 1st. That is an increase of 5,339,351 sq. ft., or 28 per cent.

During the same period, 27,261 additional shop employees were hired, to bring the total to 173,076, an increase of 19 per cent. The total floor area of the industry on March 1st, including engineering and clerical, combined with productive floor area, was 31,383,967 sq. ft. The total personnel, including executive, accounting, engineer-

Monthly figures for production of aircraft of military value (military craft and airline transports) are shown in this graph. The dotted line represents the present trend with variations smoothed out.



ing and research, as well as shop employees, was 226,172. This does not cover aircraft manufacturing activities of the automobile industry.

Export

An analysis of the January total of 1,036 U.S. aircraft is illuminating. It was distributed as follows:—

United Kingdom	102
Canada	135
Gold Coast (for Near and Middle East)	120
Malaya (Singapore)	43
South Africa	19
	<hr/>
To U.S. Navy	419
To U.S. Army	296
To U.S. airlines	242
To other sources	26
	<hr/>
	1,036

This indicates that Britain got 419 against the figure of 538 to the U.S. Army and Navy, less than an equal share. Later figures released show that Britain received 258 aeroplanes in February and 414 in March.

Total civil aircraft built during the year 1940 numbered 6,670, of which only 137 were of 600 h.p. or over. These are the ones which are of military value. The total was sub-divided thus:—

Under 100 h.p.	5,894
100 to 600 h.p.	597
600 to 1,800 h.p.	137
Unclassified	42

Total civil aircraft built in 1940 6,670

Ultra-light aircraft of under 100 h.p. are numerous, but it is likely that their production will be cut considerably this year, for a complete ban on the supply of aluminium to factories other than those classified as "defence industry" has been imposed. Those making all-metal craft will be particularly hard hit unless they can persuade Government authorities that they come within that category.

POWER OF THE RING

OUR contemporary, *American Aviation*, in its issue of February 15, reports on a matter which, if true, will rouse the indignation of all who hear of it. In days when democracy is fighting for its life, its people do not like to hear of those within its gates whose only thought is of profit, particularly when their efforts to obtain those profits hamper the war effort to win. The American report reads as follows:—

"Criminal indictments by a Federal grand jury were recently brought against an alleged international magnesium trust accused of restricting the development and use of magnesium and magnesium alloys in the production of aeroplanes, bomb casings and other defence materials. Five American corporations, including Aluminium Company of America, Dow Chemical Co., General Aniline and Film Corp., Magnesium Development Corp., and American Magnesium Corp., were named, along with I.G. Farbenindustrie of Germany.

"The defendants were charged with conspiring since 1927 to

control and regulate the world's magnesium output, largely through world-wide patent pools. Department of Justice officials declared that the alleged conspiracy has created a serious shortage of foundry facilities for magnesium production in this country and is indirectly responsible for Germany's producing 400 per cent. more magnesium than the U.S.

"The indictments charge that all competing patents owned by the German firm, Alcoa and Dow, have been pooled and utilised to prevent others from engaging in magnesium production. The Dow company, a selected list of its licensees, and American Magnesium Corp. now control all production in the U.S., it was alleged.

"Pleas of not guilty to violation of the anti-trust laws have been entered by the five U.S. corporations and seven individual American defendants. The court entered a similar plea for I.G. Farbenindustrie when representatives of that firm failed to appear."

HERE AND THERE



NOT THE SCHOOL FOR SCANDAL—but the training school run by United Air Lines for the instruction of their hostesses in all the various matters, from meteorology to the care of babies at ten thousand feet, which they must know.

U.S. Air Officers for Britain

THE U.S. Army Air Corps is sending a number of its officers to Britain to act as observers of the war in the air and to familiarise themselves with the conditions of modern combat.

Flight-test Insurance

IT is reported from Los Angeles that the insurance premium for the first minute of the forthcoming test flight of the leviathan Douglas B-19 bomber is £20,500. After the first minute the insurance rate will drop to £750 per hour, the machine being insured for £250,000, and there isn't even the usual rebate if the owner stands the first £5 damage! The test flight is expected to take place very shortly.

Australian Beaufort Flies

THE first Beaufort to be manufactured by the Aircraft Production Commission in Australia made a successful test flight on May 5th. This is far from being the first military aeroplane to be manufactured in Australia, but it is the largest and most powerful, and its first test flight is the passing of another aeronautical milestone in that country.

Transatlantic Air Service

JUNE will see the resumption of the transatlantic air service between Northern Ireland and America, and preparations are now well under way at Foynes, according to a recent report. British Overseas Airways Corporation will operate the service through its subsidiary company, Airways (Atlantic), Ltd. No American company, of course, would be allowed by the U.S. Government to run a service into a combatant zone.

Into Dutch New Guinea

THE Australian territory in New Guinea has for many years past been adequately served by airlines for passengers and freight, but this has not been so in Dutch New Guinea. Recently a service was started by K.N.I.L.M. under charter to the Netherlands East Indies Government with a weekly flight by Grumman 21A amphibian to the Wissel Lakes. Though intended primarily for Government officers and cargo, private

passengers may travel also if seats are available. Thus for the first time the interior of New Guinea is connected by air to Celebes and Java.

What It Takes

COMMENTING upon the production of aircraft engines in U.S.A., a recent issue of the *Financial News* says that present aero-engines demand manufacture of 5,000 separate parts to each complete unit, and it is calculated that, in one of the country's major plants, an engine developing 1,700 h.p. takes between 5,000 and 6,000 man-hours, requires 45,000 individual machine operations and at least an equal number of rigorous tests.

Cat's Eyes?

A CANADIAN scientist stationed at the fisheries laboratory near Prince Rupert, British Columbia, is working on

a plan which he hopes may make some contribution towards beating the night bomber. Dr. H. N. Brocklesby is approaching the problem by attempting to develop after-dark sight for British pilots rather than by seeking an artificial substitute for vision. Certain vitamins give the human eye greater adaptability and enable it to adjust itself better to darkness. The experiments are being conducted on such vitamins.

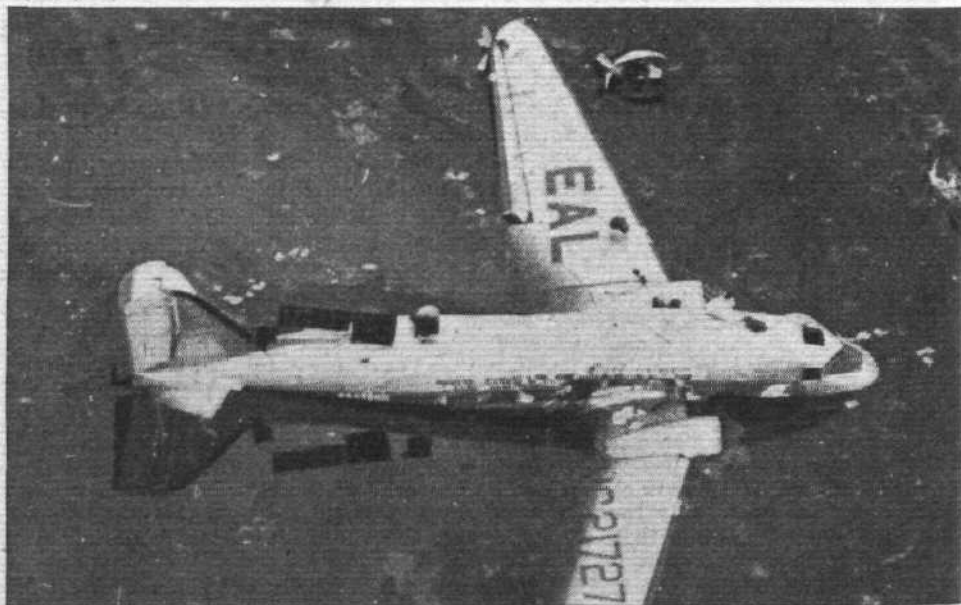
Argentine to Canada

TO enlist for training in the British Commonwealth Air Training Plan, five more young men have arrived in Canada from Buenos Aires. Aged between 21 and 27, they are all British though they were born in the Argentine.

They Will Hit Back

ON the anniversary of the bombing of Rotterdam, which was May 14th, 64 Spitfires and 31 bombers, purchased by the Free Dutch, were formally handed over to the Dutch military authorities in this country. The machines will be flown by Dutch pilots who have arrived here from the Dutch East Indies where most of the money has been raised.

Already some £100,000 has been thus contributed to what is known as the Prince Bernhard Fund, which is now to concentrate on the purchase of motor torpedo-boats.



HANGING OUT THE WASHING IN THE EVERGLADES: On its way from Miami to New York this Eastern Air Lines Douglas DC-3 was forced down by a storm on to the slimy waters of the Florida Everglades. Though the two engines were thrown out of their mountings and the fuselage of the aeroplane buckled, the pilot may be said to have brought off a satisfactory landing as none of the sixteen persons aboard was killed. Unfortunately, all sustained injuries, but not serious ones. One engine and a wheel can be seen, and the marooned airman on deck seems to be filling in time by doing his washing.



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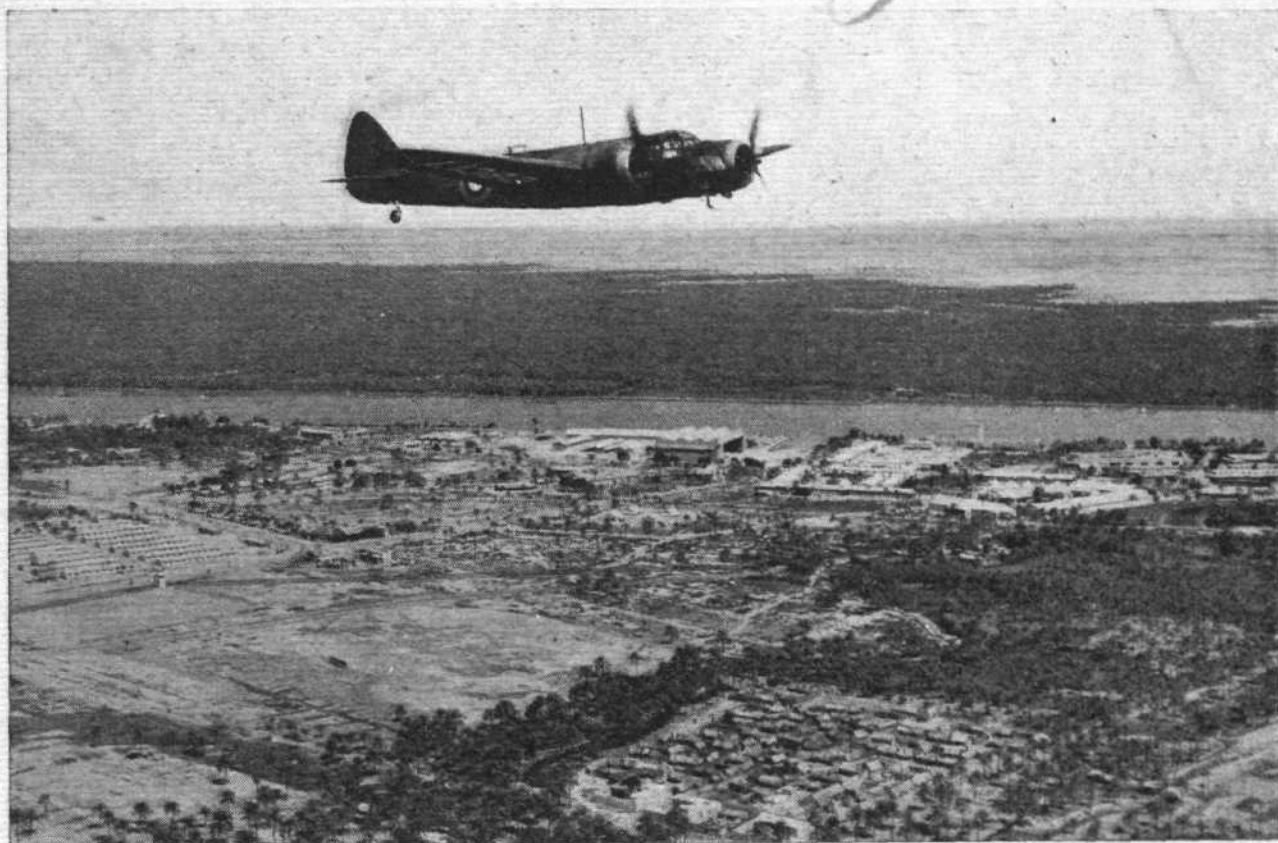
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THE DRIVE FOR VICTORY

HERE AND THERE (Continued)



EYES OVER IRAQ : Recent activities in Iraq have once again proved the efficiency of the R.A.F. whenever and wherever called upon. This picture shows a "short-nosed" Blenheim flying over Basra.

Aluminium in Australia

CONSIDERATION is being given to the establishment of an aluminium industry in Australia by the utilisation of bauxite deposits which exist there.

A Postponed Trippe

MR. JUAN TRIPPE, president of Pan American Airways, was to have delivered the Wilbur Wright lecture to the Royal Aeronautical Society to-day, May 15th. The Society has been advised that Mr. Trippe has had to postpone his journey, so there will probably be something like a month's delay in reading the paper, which will deal with ocean air travel.

Republic Thunderbolt Tested

THE latest American fighter, the P-47, made by the Republic Aviation Company and known as the Thunderbolt, was test-flown on May 8th at Farmingdale, New York. It is powered with a single Pratt and Whitney 2,000 h.p. engine and is intended for high-altitude work in the 30,000 to 40,000 feet levels. The speed of the Thunderbolt has not been revealed but is probably in the 400 m.p.h. neighbourhood.

And Granny Came, Too!

AMONG recent callers at the R.A.F. Information Bureau in London's blitzed West End was a potential recruit for the W.A.A.F. who gave her age as 38, but who was obviously a trifle older than that. This gallant "old girl" wanted to be a fabric worker, stoutly maintaining that she could handle a

sewing-machine with the best, but when she was finally obliged to admit that she had reversed the figures of her age and that she was really 83, her enrolment was reluctantly refused. "Granny" was patently disappointed, but said they couldn't stop her knitting for the R.A.F. Comforts Fund, anyway!

Greeting from Hungary

A CHRISTMAS card from a reader of *Flight* in Hungary has just been received by the Editor. It was posted on December 23rd in Budapest and has, therefore, been nearly five months on the way, but the marvel is that it got here at all. Incidentally, the sender's signature recalls the happy days of the *Magyar Pienios* when British private owners used to pay flying visits (in the literal sense, of course) to that once-gay European capital.

"Time" Flies

IT has fallen to the lot of that progressive American journal, *Time*, to produce the world's first special lightweight "air express edition" for cheap delivery by air to far-away subscribers—a feat which, simple enough in itself, may nevertheless revolutionise the publishing world if other magazines follow suit.

Commenting on this important development, *Commercial Aviation* points out that by thus introducing a lightweight edition, their readers in South America, Alaska, Hawaii and the Philippines will not only be able to get the magazine far more cheaply than hitherto, but will receive it on or before the date of pub-

lication on the cover. Previously the normal edition, if sent by air, was very expensive, and if sent by surface transport, was not received in these distant places for some three weeks. Air carriers would obviously benefit if this new idea became general.

Go by Air

SUCH is the exhortation on the summer time-table leaflet issued by Scottish Airways, Ltd., in which details of its scheduled services operating from now "until further notice" are set forth.

The services, of which there are five, range from Glasgow, via Islay and the Hebrides, to Inverness and on to the Orkney and Shetland Isles.

Fund-raising "Flitfires"

IN case you haven't heard, a Flitfire is a light American aircraft engaged in raising dollars for the American branch of the R.A.F. Benevolent Fund which is getting well under way just now in New York.

With their usual flair for energetic organisation, the New Yorkers recently held an "R.A.F. Party" at the La Guardia airport, the culminating point of which was the departure of a light plane to every one of the country's 48 States on a fund-raising flight.

And with their even more famous flair for finding a word for it (at which they out-Greek the Greeks!) our good American friends have expressed the co-operative link between their little aerial fund-raisers and the R.A.F. by dubbing them "Flitfires."

Snappy landings, boys!

Service Aviation

N.Z. Fighter Squadron

THE first fighter squadron of the R.A.F. to be composed entirely of New Zealand pilots is now completing its training at a station in the north of England. The formation of the new squadron has brought together some two dozen New Zealanders from other squadrons to which they had earlier been posted.

W.O. Pilots

TWO new ranks are to be introduced into the Royal Air Force. They will probably be Flight Sergeant Pilot and Warrant Officer Pilot.

Hitherto sergeant pilot has been the only rank available to airmen pilots in the Service. The result has been that no advancement has been possible except by taking a commission.

The introduction of the new Stirling, Halifax and Manchester bombers has made it more than ever desirable that there should be some advancement open to sergeant pilots other than through the taking of commissioned rank. The chief pilots of these big machines undertake heavy responsibilities.

Royal Visitor

Night fighter stations in the West Country were recently visited by The King. Among the pilots he met in the evening were two who later contributed to the record number of enemy raiders destroyed during the night.

The King was accompanied by the Air Officer Commanding in Chief, Fighter Command, Air Marshal W. Sholto-Douglas, and by the Air Officer Commanding the group, Air Vice-Marshal Sir Quinton Brand. Pilots, air crew and ground staff were presented to The King, and at one station he spoke for some time with a squadron leader, who, shortly after his conversation with The King, took off and shot down a Heinkel 111.

More Officers for W.A.A.F.

PLANS for the rapid expansion of the W.A.A.F., and the increasing variety of duties which airwomen are now being called upon to perform, have created the need for many more officers. This brings an opportunity for more rapid promotion to the right type of woman. Women who are intelligent and efficient will be considered for officer appointment at the earliest possible moment.

A new departure is to earmark for officer appointment any woman who is likely to become an efficient officer either by reason of previous experience or civilian qualifications. This will be done immediately she joins the W.A.A.F. and every encouragement will be given to her to apply for officer appointment at an early stage of her career.

F.A.A. Pilots

Men who have obtained their "A" or "B" licence as civil pilots can now be considered for



Royal Air Force and Fleet Air Arm News and Announcements

temporary commissions in the Air Branch of the R.N.V.R., provided they are still under 45 years of age. If accepted, they will be granted a commission as Probationary Temporary Sub-Lieutenant (A), R.N.V.R., and after a period of training will be employed on non-operational flying duties. Those who prove suitable for combatant service will be given further training to fit them for operational flying. All officers will be eligible for promotion in the same way as other officers in the Air Branch of the R.N.V.R.

Awards

THE King has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

DISTINGUISHED SERVICE ORDER.

Act. Wing Cdr. P. W. TOWNSEND, D.F.C., No. 85 Squadron.—This officer has displayed outstanding powers of leadership and organisation, combined with great determination and skill in air combat. By his untiring efforts he has contributed materially to the many successes obtained by his squadron. Wing Cdr. Townsend has been engaged on active operations since the war began and has carried out numerous operational flights, both by day and night. He has destroyed at least 11 enemy aircraft.

DISTINGUISHED FLYING CROSS.

Sqn. Ldr. P. JEFFREY, No. 3 Squadron, R.A.A.F.—This officer has commanded and led his squadron with exceptional skill. By his untiring efforts and his high standard of efficiency he has contributed materially to the success obtained by his squadron in protecting our ground forces under extremely trying conditions. On a recent occasion, he carried out a low flying attack on an enemy landing ground, during which he shot down a Junkers 52 and destroyed a further three of these aircraft on the ground.

Flt. Lt. P. G. H. MATTHEWS, No. 1 Squadron.—This officer has been engaged on active operations against the enemy over a long period. He has displayed high qualities of leadership and exceptional tactical ability. He has destroyed at least four enemy aircraft.

Act. Flt. Lt. A. V. CLOWES, D.F.M., No. 1 Squadron.—This officer has displayed great skill

in his engagements against the enemy and has destroyed at least 11 of their aircraft. His coolness and judgment on an occasion have been an inspiration to his fellow pilots.

F/O. A. A. P. WELLER, No. 274 Squadron.—In April, 1941, this officer carried out an attack against enemy aircraft at Benina. Pressing home his attack with great skill, he destroyed seven Junkers 52 and caused heavy casualties to troops emplaned. To achieve this success, F/O. Weller flew a distance of 880 miles.

P/O. K. J. HOLMES, No. 217 Squadron, Coastal Command.—One night in April, 1941, this officer was the captain of an aircraft detailed to attack enemy battle cruisers in the dock at Brest. In the face of intense and accurate anti-aircraft fire and searchlight activity, he descended to a low altitude and released his bomb-load over the target. He displayed great courage and determination under extremely harassing circumstances.

Wing Cdr. T. G. PIKE, No. 219 Squadron.—This officer, who recently resumed command of the squadron, has shown great skill in intercepting enemy aircraft at night. During his first patrol, he intercepted and, it is believed, destroyed a raiding aircraft. He has since destroyed three enemy aircraft, of which two were destroyed during one night. His keenness and example have had a splendid effect on other members of his squadron.

F/O. B. FINUCANE, No. 65 Squadron.—This officer has shown great keenness in his efforts to engage the enemy and he has destroyed at least five of their aircraft. His courage and enthusiasm have been a source of encouragement to other pilots of the squadron.

Act. Squadron Leader B. HEATH, A.A.F., No. 611 Squadron.

Flight Lieutenant D. H. WATKINS, A.A.F., No. 611 Squadron.

Act. Flight Lieutenant J. E. MARSHALL, No. 85 Squadron.

Flying Officer J. S. MORTON, A.A.F., No. 603 Squadron.

Flying Officer H. C. UPTON, No. 43 Squadron.

P/O. G. E. FOWLER, R.A.F.V.R. No. 75 (N.Z.) Squadron.

P/O. O. R. MATHESON, R.A.F.V.R. No. 75 (N.Z.) Squadron.

One night in April, 1941, P/Os. Matheson and Fowler were captain and navigator respectively of an aircraft detailed to attack a target in Berlin. On the first run anti-aircraft fire inflicted severe damage on the aircraft, causing it to lose height. Nevertheless, P/O. Matheson regained height and, guided by P/O. Fowler, made a second run over the target, which was successfully bombed. Previously both officers were concerned in an attack on Kiel, returning with photographs containing much valuable information. P/O. Matheson and P/O. Fowler have completed numerous operational missions and both have displayed persistent devotion to duty, great courage and outstanding skill.

DISTINGUISHED FLYING MEDAL.

Sgt. W. G. RIPLEY, No. 604 Squadron.—This airman has participated in numerous engagements against the enemy. By his skill and efficiency as wireless operator-air gunner he has materially assisted in the destruction of five enemy aircraft.

THE KING has been graciously pleased to approve the following awards:—

GEORGE MEDAL.

F/O. D. V. C. COTES-PREEDY.—This officer, the pilot of an aircraft which crashed shortly after taking off, just before dawn one day in January, 1941. The aircraft burst into flames on impact, and the observer was thrown out. F/O. Cotes-Preedy forced his way out and found the observer lying in burning petrol. He dragged the observer clear, rolled him in the grass to extinguish his burning clothing, and then returned to the aircraft to search for the air gunner. Finding the gunner's escape hatch jammed, F/O. Cotes-Preedy ripped the side of the fuselage and succeeded in dragging the air gunner out by his head. Although injured and suffering from burns, F/O. Cotes-Preedy displayed great gallantry and initiative. He undoubtedly saved the life of the air gunner, and was of great assistance to the observer.

F/O. R. G. ROBINSON, R.A.F.V.R.

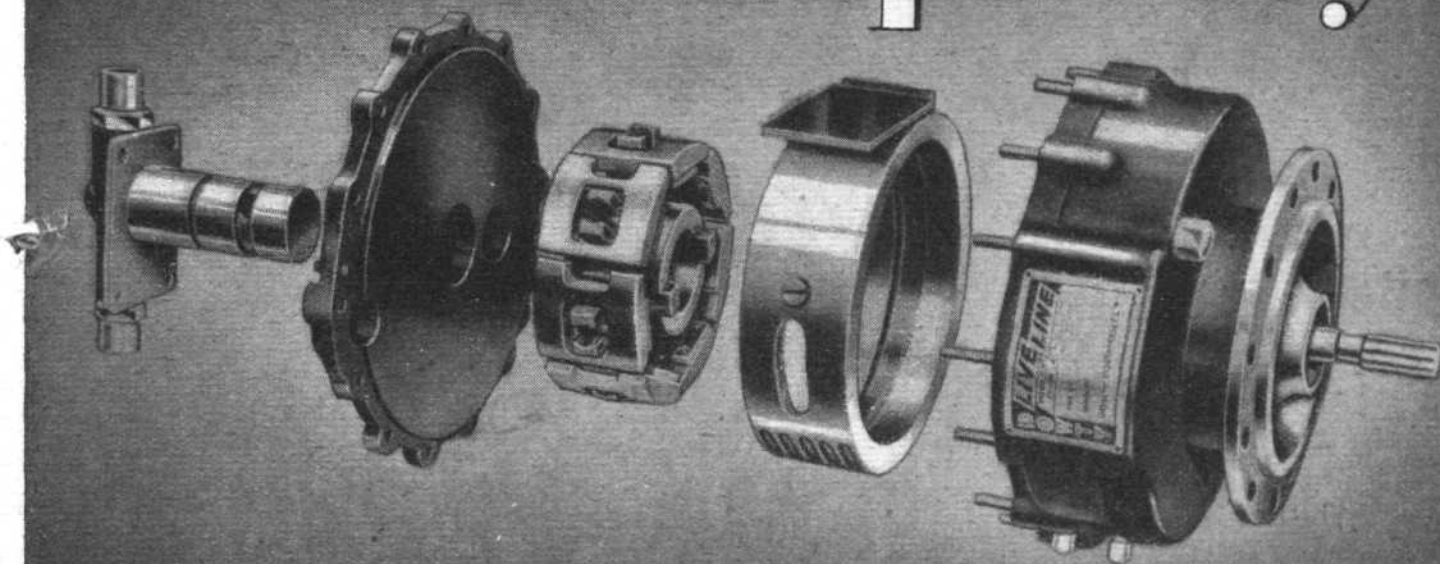
Cpl. J. TAYLOR.

One day in February, 1941, an aircraft crashed just beyond the boundary of an aerodrome. F/O. Robinson, medical officer at the station, was at the scene of the accident almost immediately and was first seen crawling through heavy smoke and fumes, but, when he had nearly reached the wreckage, he was forced back owing to an explosion of one of the main petrol tanks. Undeterred, however, he returned to the seat of the fire, which was around the pilot's cockpit, where he was joined by Corporal Taylor, who had been



KNOCKING THEM DOWN: A game of skittles in progress at a night-fighter squadron.

Robust simplicity



- The **DOWTY LIVE-LINE PUMP** is designed for use on standard aero engine accessory drives at speeds up to 4,000 r.p.m.

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A 4 POINT PLAN TO INCREASE WAR PRODUCTION

A MESSAGE TO MANAGEMENT.

In a recent broadcast speech, Mr. Ernest Bevin, Minister of Labour and National Service, showed how urgent was the need for more workers — especially women — in Great Britain's War Industries. Employers who are playing *their part* in the drive for greater and still greater war production will find this 4-point plan a sure guide.

HERE ARE THE FOUR VITAL POINTS LAID DOWN BY THE MINISTRY OF LABOUR.

- 1 Skilled men are needed for the really skilled jobs. Be sure that each of your men is employed up to the very limit of his skill. Combat skilled labour shortage by breaking down processes wherever you can, and by training up your workpeople, men and women, to jobs of greater skill.
- 2 Training Schemes must be developed to the greatest possible extent. Take in more new workers for training on the job in your own works. Remember that the Government will help you with semi-skilled men and women trained under official schemes.
- 3 Prepare, now, to employ more and more women. Look constantly to women for your new recruits: they are excellently suited to many types of semi-skilled work. Hundreds of thousands must enter war production this year and every factory must play its part.
- 4 Efficient personnel management is essential. Remember that you must secure the whole-hearted co-operation of your workpeople. Look closely to their welfare. Many of them may be new to industry: be patient and help them all you can during the first difficult weeks. A little foresight will reduce your labour turnover.

THE MINISTRY OF LABOUR AND NATIONAL SERVICE HAS DISTRIBUTED A GUIDE TO THE EMPLOYMENT AND WELFARE OF WOMEN WORKERS. EVERY RESPONSIBLE EXECUTIVE—WHETHER HE BE EMPLOYER OR MANAGER—MUST INSIST ON SEEING IT.

You should make a special point of reading the new booklet "THE EMPLOYMENT OF WOMEN. . . SUGGESTIONS TO EMPLOYERS." Problems created by the increasing influx of new women workers into war factories are dealt with clearly . . . concisely; and the suggestions contained in the booklet will be of interest and great value to YOU! If you have not yet received your copy, instruct your secretary to write for one TO-DAY, to the local Employment Exchange, asking for pamphlet P.L. 87/1941.

These are the contents in the Booklet:

- | | |
|---|-------------------------------------|
| 1 Appointment of a Woman Personnel Officer. | 4 Interviewing of candidates. |
| 2 Functions of a Woman Personnel Officer. | 5 On engagement. |
| 3 Consultations preparatory to the introduction of Women. | 6 On reporting for duty. |
| | 7 During first month of employment. |
| | 8 Working hours. |

MOBILISE FOR



SERVICE AVIATION (Continued)

playing football and had run to the crash clad only in his football kit.

Together they attempted to extricate the only remaining member of the aircraft. To assist them in their efforts, a foam apparatus was turned directly on them. Although petrol and oil tanks, ammunition and Vercy lights were exploding, Flying Officer Robinson and Corporal Taylor persisted in their efforts and finally extricated the body. Both displayed great courage and a complete disregard for their own safety, and although both suffered from the effects of the foam sprayed on them it undoubtedly saved them from being gravely burned. On a previous occasion Flying Officer Robinson displayed the greatest courage in attempting to rescue the members of a burning aircraft, in spite of exploding bombs and ammunition.

L.A./C. G. A. HUTCHINSON.—During a fire in a top-storey room at a Royal Air Force station, one day in February, 1941, L.A./C. Hutchinson succeeded in getting on to the roof and then climbed along the side of the wall, getting down on to a stack-pipe, from which he assisted a number of occupants to safety. Thinking the room was clear, he had started to get down himself when another airman appeared at the window, badly burned and with his clothing on fire. This airman got on to the window-ledge and locked his arms round the window frame, but, owing to his dazed condition, he could not, or would not, let go.

L.A./C. Hutchinson, realising the airman's position, and showing complete disregard for his own safety, climbed back on to the window-ledge and tried to beat out the flames on the airman's tunic, but he was unsuccessful in doing this. He managed to get the airman away, however, by forcing him to release his grip on the window frame; by this time the room was a mass of flames. L.A./C. Hutchinson faced great danger from burning and from the collapse of the building, and exhibited bravery of a high order in returning for the final rescue. Unfortunately, the airman whom he rescued has since died.

BRITISH EMPIRE MEDAL

Flt. Sgt. A. S. J. CURTIS.

Cpl. W. Hogg, R.A.F.V.R.

Flt. Sgt. Curtis was engaged in supervising the unloading of live bombs from a lorry, unaware that they had previously formed part of the bomb load of a damaged aircraft. During the process a bomb exploded, immediately killing a number of airmen and setting fire to the vehicle. Flt. Sgt. Curtis and Cpl. Hogg unhesitatingly approached the blazing vehicle and, with great personal courage, removed the bodies of the dead airmen.

L.A./C. (now Corporal) C. J. KISS.

A/C.1 G. GILL.

A/C.1 F. HINDLEY.

One day in December, 1940, a training aircraft crashed, burst into flames and was burnt out in a few minutes. The passenger was thrown clear but died from his injuries. The pilot, who was badly injured, was pinned in the burning wreckage, but was extricated by the gallant efforts of these three airmen, who, in so doing, undoubtedly saved his life.

London Gazette

Royal Air Force

Air Ministry.
May 2, 1941.

General Duties Branch.

The follg. are granted commns. for dura. of hostilities as P/Os. on probn.:—Flt. Sgts.: (June 18, 1940, Sen. May 9, 1940) L. K. Wilcox; (April 2) M. Cameron, Sgts.: (Jan. 17, 1940) D. H. A. Skillings; (Feb. 11) C. G. L. Williams, D.F.M.; (April 1) G. B. Johns; (April 12) T. S. W. Towell, D.F.M.

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war subvte. rank of F/O.:—(Oct. 8, 1940) A. M. Ruston; (Mar. 16) A. R. T. Beddow; (April 1) R. W. Ferguson.

The follg. F/Os. are promoted to war subvte. rank of Flt. Lt.:—(Jan. 30) J. R. Aldis; (Feb. 24) R. W. McCarthy; (April 23) D. B. Drakes; (April 27) I. D. S. Strachan; (April 30) E. Coton.

The follg. P/Os. are promoted to war subvte. rank of F/O.:—(Sept. 30, 1940) R. E. Atkinson; (Dec. 6, 1940) D. H. B. Relton; (Feb. 24) G. V. Donald, C. H. Gould; (Mar. 2) F. G. Millar; (Mar. 7) M. L. P. Bartlett (2nd Lt. Border R.); (Mar. 24) A. C. Rowe; (April 6) A. J. Pinhorn; (April 13) W. R. C. Sugden.

The follg. P/Os. are granted war subvte. rank of F/O.:—(Mar. 1) J. R. Watt; (Mar. 13) R. H. Thomas.

Wing Cdr. J. D'A. Keary is seconded for special duty (Feb. 1).

THANET LOOK-OUT: The most south-easterly Royal Observer Corps station in England. To this post falls the honour of being the nearest to the enemy.

The follg. P/Os. relinquish their temp commns. on return to Army duty (Mar. 21):—W. L. Chessier, 2nd Lt., R.A.; F. N. P. Osborne, 2nd Lt., Gren. Gds.

Technical Branch.

The follg. F/Os. are granted war subvte. rank of Flt. Lt.:—(Nov. 19, 1940) C. J. F. McRae; (Mar. 1) A. J. Hunt, S. E. Hearnden, M.B.E.; (Mar. 6) A. S. Kerr; (Mar. 9) T. V. Nelson, D. J. Gammack, P. W. J. Dawes, F. Hills, W. J. James, J. Nash, A. E. Wyatt, W. E. Gray, S. Muir, G. C. Turner, G. E. H. Walker, R. E. Wilson; (Mar. 13) H. Wright, M.B.E.; (Mar. 16) R. J. B. Jackson; (Mar. 23) W. H. Jones; (Mar. 28) J. A. MacRae; (Mar. 31) L. T. Card.

The follg. P/Os. are granted war subvte. rank of F/O.:—(Mar. 5) J. G. Portlock; (Mar. 28) L. A. Huxford.

The follg. P/Os. on probn. are promoted to war subvte. rank of F/O. on probn.:—(Jan. 12) I. E. Hill; (Feb. 22) F. W. Wilkins; (Mar. 1) D. P. Davies.

Administrative and Special Duties Branch.

The follg. Act. P/Os. on probn. are graded as P/Os. on probn. (Mar. 28):—A. Vicary, C. Dewar.

The follg. F/Os. are granted war subvte. rank of Flt. Lt.:—(Mar. 1) S. Mackenzie, J. H. Over; (Mar. 5) G. R. C. Baker; (Mar. 13) J. Leckie.

P/O. A. G. Webb is granted war subvte. rank of F/O. (Mar. 23).

Equipment Branch.

F/O. W. E. Tyrie is granted war subvte. rank of Flt. Lt. (Mar. 27).

P/O. on probn. C. I. Reeder is promoted to war subvte. rank of F/O. on probn. (Mar. 1).

P/O. N. C. Ogilvie is promoted to war subvte. rank of F/O. (Mar. 17).

Accountant Branch.

The follg. F/Os. are granted war subvte. rank of Flt. Lt.:—(Feb. 6) C. P. Weeks; (Mar. 1) E. A. Winter; (Mar. 3) H. G. A. Orbell; (Mar. 25) E. J. Watson.

Royal Air Force Reserve

Reserve of Air Force Officers.

General Duties Branch.

Sqn. Ldr. E. G. Holden is granted rank of Wing Cdr. (Apr. 5).

The follg. F/Os. are promoted to war subvte. rank of Flt. Lt.:—(Mar. 23) W. H. A. Wright; (May 2) E. Sprawson.

F/O. B. R. Ker is granted war subvte. rank of Flt. Lt. (Mar. 16).

P/O. J. E. Storey is promoted to war subvte. rank of F/O. (Apr. 29).

Flt. Lt. L. S. Dawson is transf'd to Technical Branch (Dec. 21, 1940).

Flt. Lt. H. P. Wilson is dismissed the Service by sentence of General Court-Martial (Apr. 16).

Technical Branch.

The follg. F/Os. are promoted to war subvte. rank of Flt. Lt. (Apr. 24, 1940):—E. C. Boucher, R. J. Hibberd, H. N. Miller, L. W. Norman, A. Prescott.

F/O. C. Webster is granted war subvte. rank of Flt. Lt. (Mar. 15).

Royal Air Force Volunteer Reserve

General Duties Branch.

The follg. are granted commns. for dura. of hostilities as P/Os. or probn.:—(Mar. 31) O. J. F. Jones-Lloyd, Sgts.: (Feb. 28, sen. Oct. 28, 1940) W. A. Smith; (Mar. 4, sen. Oct. 28, 1940) F. Gibbs; (Mar. 25) I. K. Woodroffe; (Apr. 2) E. R. Phillips; (Apr. 3) I. J. Davies, G. F. Lamber, A. E. Millson, W. D. C. Erskine.

Crum; (Apr. 4) R. F. Speedy; (Apr. 5) J. W. Macdougall, I. D. Roxburgh; (Apr. 7) G. H. Webb; (Apr. 8) I. A. N. Atchison; (Apr. 10) T. F. Keill; (Apr. 12) C. A. Hughes, D.F.M. L.A./C.: (Nov. 29, 1940) J. S. Logan; (Dec. 12, 1940) P. A. Ranicar; (Dec. 21, 1940) F. J. R. T. Minster, G. B. Chapman; (Mar. 9) A. J. Deardon; (Mar. 23) J. F. C. Gallaher, R. V. C. Bolster, D. Brooker; (Apr. 1) A. D. Cullen, H. M. S. Green, H. O. Knowles, R. D. Luckwell, W. L. Macdonald, J. H. Manley, R. N. Thwaite; (Apr. 3) V. M. Albrecht, J. C. Broadhurst, E. A. G. G. Bruce, W. A. M. Halley, L. W. Kitchen, J. J. de Ledesma, J. F. Reid, H. B. Robertshaw, C. N. Small, L. Whiteside, J. H. P. Foster, D. R. Gibbs, D. B. Delany, H. R. Ellis, A. E. Richardson; (Apr. 8) R. D. Bell, R. O. Curtis, R. L. R. Davies, B. P. T. Horsley, W. H. B. Pritchard, P. A. Rippon, J. C. Smith, A. W. D. Londer, A. V. Plowright, R. F. Talbot, K. S. Booth, J. Bryan, J. R. Frith, G. J. Haines, G. F. Robertson, D. H. Wood-Samman; (Apr. 10) D. M. Crossley, D. E. Dixon, C. O. S. Gibb, B. D. Hanafin, R. J. Hardy, W. J. Mair, S. D. Mayhew, T. B. Stoney, W. J. J. Welch; (Apr. 17) R. N. G. Allen, G. T. Bartlett, G. S. Eccles, A. E. Hacking, F. Harding, H. A. T. Lind, G. Pringle, W. H. Thomlinson, H. V. Wilgar-Robinson.

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war subvte. rank of F/O.:—(Mar. 7) A. R. Brown; (Mar. 10) R. M. Biden; (Mar. 17) C. B. Payne; (Mar. 24) F. J. Brayley.

P/O. on probn. R. McK. Jamison is confirmed in his appt. Dec. 30, 1940, and promoted to war subvte. rank of F/O. (Feb. 26).

The follg. P/Os. on probn. are confirmed in their appts. Jan. 13 and promoted to war subvte. rank of F/O. (Mar. 2):—G. S. Bliss, A. G. F. Hobbs, J. D. Peterkin.

P/O. on probn. J. C. Bowman is confirmed in his appt. Mar. 9 and promoted to war subvte. rank of F/O. (Apr. 20).

P/O. O. V. Holmes is confirmed in his appt. Mar. 19 and granted war subvte. rank of F/O. (Mar. 5).

The follg. P/Os. are granted war subvte. rank of F/O.:—(Feb. 4) J. H. White; (Feb. 22) E. G. Ford; (Mar. 5) A. Allan.

The follg. Act. P/Os. on probn. are graded as P/Os. on probn. (Aug. 20, 1940):—E. D. Comber-Higgs, L. E. Small, L. G. Wrenmore.

The follg. F/Os. are promoted to war subvte. rank of Flt. Lt.:—(Feb. 15) M. T. Stephens; (Mar. 27) T. L. Sandes; (Apr. 20) C. M. Miller, D.F.C., A. S. Worthington; (Apr. 28) G. F. Gregory.

The follg. P/Os. on probn. are transf'd. to Administrative and Special Duties Branch (Apr. 18):—J. E. Johnston, M. E. Shields.

Technical Branch.

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war subvte. rank of F/O.:—(Feb. 16) R. C. Couzens, C. A. H. Gaudie; (Feb. 26) J. A. Payne; (Mar. 14) T. R. Hancock; (Mar. 25) R. H. Thomas; (Mar. 31) L. Cushion, F. C. Jones.

The follg. F/Os. are granted war subvte. rank of Flt. Lt.:—(Mar. 1) J. K. Hankinson; (Mar. 9) W. Beattie.

P/O. H. Allen is granted war subvte. rank of Flt. Lt. (Mar. 7).

The follg. F/Os. are granted war subvte. rank of F/O.:—(Mar. 1) G. Dexter; (Mar. 18) E. L. T. Barton; (Mar. 28) E. L. Vaughan.

Balloon Branch.

The follg. are granted commns. for dura. of hostilities as P/Os. on probn.:—Cpls.: (Mar. 14) J. Posner; (Mar. 12) A. A. Spence.



SERVICE AVIATION (Continued)

P/O. A. H. Brown is promoted to rank of F/O. (Feb. 5).

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war subvise. rank of F/O.:—(Mar. 11) E. H. Wilkinson; (Apr. 15) S. P. S. Bartlett.

Administrative and Special Duties Branch.

The follg. are granted commns. for durn. of hostilities as P/Os. on probn.:—(Oct. 3, 1940) D. P. Taylor; (Feb. 21) A. D. Stewart; (Mar. 3) G. L. Blair; (Mar. 22) F. F. Ogilvy; (Mar. 31) T. G. Mapplebeck; (Apr. 4) Sir C. M. R. V. Duff-Assheton-Smith; W. J. Farr; (Apr. 5) J. O. Davis, S. W. Fry, C. T. Halford, D. A. Inglis, J. M. Rickard, C. G. Sergeant, J. K. D. Thomson; (Apr. 7) R. R. Rawson; (Apr. 8) R. W. Hey; (Apr. 11) R. L. Howland; (Apr. 12) W. Bainbridge, J. R. Duncan, K. H. Farrah, W. C. Hill, J. J. Kydd, A. Robertson, H. Williams; (Apr. 16) A. E. Lewis. As Act. P/Os. on probn.:—Ft. Sgts. (Apr. 10) T. Hamilton; (Apr. 11) T. E. Turnbull. Sgts. (Mar. 28) F. K. Smith; (Apr. 11) A. F. Armstrong; (Apr. 12) F. Linton. Cpls. (Apr. 4) E. E. O. Elwin; (Apr. 11) G. T. Bell, G. R. Wicks, R. E. Nall, J. Durbin; (Apr. 12) C. H. Craig. Ldg. Aircraftmen: (Apr. 11) T. L. Outhwaite, P. Goldbloom, T. H. P. Hartley, A. A. N. Beveridge. A/C.1: (Apr. 11) H. G. Woods; (Apr. 12) S. H. Todd. A/C.2: (Apr. 5) R. D. E. Lewis; (Apr. 11) W. Strachan, D. G. H. Rance, M. Taute, R. C. Pharaoh, R. W. Dale.

P/O. on probn. F. O. Rowe is confirmed in his appt. and promoted to rank of F/O. (Mar. 30).

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war subvise. rank of F/O.:—(Jan. 24) F. W. Turpin; (Jan. 29) M. G. Davidson; (Feb. 28) R. H. N. Saunders; (Mar. 4) D. C. Lynch; (Mar. 5) A. J. Dronsfield; (Mar. 10) J. Morris; (Mar. 14) T. B. Child; (Mar. 15) G. B. Harding; (Mar. 18) C. C. Castle; (Mar. 28) P. N. L. Nicholson; (Mar. 30) J. C. Hardman; (Apr. 8) A. Thomson; (Apr. 10) S. P. R. de Moysse-Bucknall; (Apr. 26) H. W. Cousins.

P/O. on probn. T. T. Davies is confirmed in his appt. Jan. 13, and promoted to war subvise. rank of F/O. (Mar. 2).

P/O. on probn. K. W. Godfrey is confirmed in his appt. Feb. 3, and promoted to war subvise. rank of F/O. (Mar. 16).

The follg. Act. P/Os. on probn. are graded as P/Os. on probn.:—(Mar. 7) H. W. Roberts, F. F. Stott; (Mar. 14) A. Richardson.

The follg. P/Os. are granted war subvise. rank of F/O.:—(Nov. 16, 1940) J. J. St. L. Martin; (Dec. 1, 1940) A. H. Rose; (Jan. 23) E. P. Nicholls, D.S.O.; (Feb. 13) J. J. Fairbairn; (Mar. 1) H. S. Rowland, E. J. Brice, A. G. B. Parlett, H. C. R. Milward, C. E. W. Manning, P. M. A. Green, E. S. Benson, L. W. B. Teeling; (Mar. 2) C. G. Reid-Walker, C. R. Whytt, C. W. Hughes, D. Reekie, D'A. Clark; (Mar. 3) J. A. O'Calla-

ghan; (Mar. 5) G. R. McIntyre, D. D. Morgan, R. A. Coleman; (Mar. 6) F. Shaw; (Mar. 8) F. Bracey; (Mar. 9) J. M. Stables, D. J. Sheridan, W. D. Hutcheson, W. G. Wilson, M.C.; (Mar. 10) E. D. Syson; (Mar. 11) R. H. Siddons, W. A. O'M. S. Brayton; (Mar. 12) N. O. K. Dibble, E. E. Edgley, M.C., M.M., Lord Chesham, M.C., W. S. J. Scruby, O.B.E., J. S. G. Eyre, S. H. J. Joel; (Mar. 13) C. Rhodes, R. Bell; (Mar. 14) G. H. Harley, R. S. Davies, G. N. Prout; (Mar. 16) G. M. B. Pearson, C. D. Hutchinson; (Mar. 17) S. Seed, F. S. Russell, D.S.O., D.F.C.; (Mar. 18) A. D. Rankine, A. R. Boyce; (Mar. 19) R. D. Clinch, J. G. Cook; (Mar. 20) H. W. Wiley; (Mar. 21) P. G. Horlington; (Mar. 23) R. K. Broader; (Mar. 24) J. C. Walker; (Mar. 26) E. R. S. Watkins, T. Evans, M.C.; (Mar. 28) R. G. Swaffield, A. H. Jones, L. D. Harris.

The follg. are transd. to Technical Branch:—F/O.: (Dec. 4, 1940) A. J. Hill. P/Os. on probn.: (Sept. 17, 1940) J. Archibald; (Oct. 7, 1940) A. F. Buick; (Nov. 11, 1940) R. L. Brooks, G. J. A. House; (Nov. 24, 1940) D. M. Cashmore, J. F. Holman; (Nov. 25, 1940) W. M. Boswell; (Dec. 7, 1940) J. J. Curnow; (Dec. 16, 1940) G. Lennie; (Mar. 8) E. Y. Lapham; (Mar. 30) J. F. Archard.

The follg. P/Os. on probn. relinquish their commns. on account of ill-health:—(Apr. 25) P. E. C. Francis; (Apr. 26) C. de W. Taylor; (Apr. 28) H. T. Perkins, K. J. Cadwallader.

P/O. W. P. Cruickshank resigns his commn. (Apr. 24).

Erratum.

In notifi. of Apr. 11 concerning P/O. on probn. I. F. Newman. For P/O. on probn. read F/O. on probn.

Training Branch.

The follg. are granted commns. for duration of hostilities as Act. P/Os. on probn.:—(Feb. 1) H. Aird, W. Blaylock, W. W. Bell, M.M., T. Brookes, W. A. Brown, F. L. Bywater, H. J. Cheshire-Martin, F. H. Cooper, R. Dickens, G. Ducker, M.C., D. G. Dunt, A. N. Dyer, G. A. Gage, C. S. F. Girling, E. Glenn, F. J. Hammond, D.C.M., C. F. J. Heath, L. F. Hodgson, A. C. Hodson, T. W. Hurst, P. M. Jackson, H. E. Jones, C. J. Lake, H. M. Lampard, F. J. Libby, H. G. P. Mapley, H. Marks, R. A. C. Mitchell, H. T. Morgan, W. L. Nicol, R. P. Pearson, G. H. Perkins, M.C., J. C. Ross, W. C. Rhymes, C. J. Russon, N. Steele, R. Swann, L. N. Wesley, E. R. Wilson, G. E. Winn, O. G. Yarnold, F. Young; (Feb. 6) G. M. Cope; (Feb. 12) G. T. L. Ansell, R. Hingworth; (Feb. 15) J. R. Ellwood, L. E. Hall, R. Jones; (Feb. 17) H. F. Boulind; (Feb. 18) G. H. Saunders; (Feb. 21) R. Ellerton, C. Isherwood; (Feb. 28) W. J. Fowler, J. Hall, H. B. Headley, G. A. Turnbull; (Mar. 4) R. M. Macandrew, F. W. White; (Mar. 5) J. B. Bassford; (Mar. 7) H. O. Jones; (Mar. 10) J. Farmer; (Mar. 20) T. H. Rowland; (Mar. 24) J. J.



BRAVO : Air Marshal L. A. Pattinson decorating Cpl. M. du Fretay, of the Free French Air Force, with the British Empire Medal. Cpl. du Fretay escaped in his own aeroplane from Brittany and landed in Cornwall.

Cook; (Mar. 26) F. Potts; (Mar. 30) J. R. Banfield, W. E. Flood, L. W. Palmer, L. Watkins; (Mar. 31) P. H. Burton, W. N. Maddock, R. G. E. Twaddle; (Apr. 1) W. P. Alexander, A. Bond, C. E. Bruton, J. R. Clarke, B. W. Durrant, F. T. Fletcher, F. C. Harwood, H. Hughes, H. I. Last, P. J. McAllister, V. R. W. Owens, J. H. Williams; (Apr. 2) N. Banks, A. D. Sutton; (Apr. 3) A. Boyle, R. M. Campbell, D. B. Colthart, F. W. Emmett, G. R. Goudie, J. Ketchin, E. H. Larkin, N. McK. Manclark, J. A. Shore; (Apr. 5) D. P. Adams, G. H. Atkinson, L. Ball, L. R. D. Beck, P. E. Bowers, H. S. Bryan, D. C. Carter, E. Chase, A. W. Cullington, A. N. Dawson, W. F. H. Dempster, D. A. Dilworth, W. J. Diment, L. K. Ecclestone, W. J. Gardiner, H. P. Gardner, G. Gibson, W. A. Gittos, G. B. Goodby, R. H. Hawker, W. I. Hughes, G. W. Ingram, G. H. Jackson, J. B. Jackson, M. Jardine, T. H. Jenkins, I. L. Jones, E. A. Langdon, V. C. Legg, W. R. Lewis, L. E. Lomas, A. Lunnon, N. McKellar, E. Middleton, E. H. Millington, M. C. Parkes, A. Parsons, J. Pattinson, E. M. Pendlebury, W. L. Pollard, H. A. Pridham, C. T. Rice, W. E. Rusholme, J. A. Sheard, G. E. Shillito, R. C. D. Simpson, W. O. F. Sinclair, C. E. Smith, S. W. Smith, R. Spall, E. A. Spendlow, J. C. C. Taylor, D. W. Wheeler, C. Whittle-Wills, W. Wilson, G. Worsley; (Apr. 7) A. B. Challinor, N. W. Fisher, H. F. Spong, R. B. Stucke, G. H. Taylor, E. Thomas, I. C. Vincent, B. G. Woodcroft, C. J. Wright, F. E. J. Wright; (Apr. 8) P. Ainslie, G. M. Barrett, W. S. Berridge, E. W. Brookhouse, H. J. Butters, F. Caley, H. Cutts, A. T. Dangerfield, H. Flood, E. Foulkes, C. P. Greaves, J. Hargreaves, G. W. Hobday, F. L. Kelly, R. J. Kirkwood, L. H. Koskie, E. A. Lamb, H. Leak, K. G. Lewis, W. H. Marshall, W. H. Meadowcroft, A. C. Mitchell, J. W. Norris, G. M. Thompson, W. N. Tranter, S. H. Vickers, H. Welborn, F. White; (Apr. 9) A. E. E. Bailey, G. W. Beynon, E. H. Botham, D. E. Davies, W. E. Davies, W. H. Herdman, R. V. Hill, E. Jackson, C. R. James, F. D. James, A. Jones, F. S. Jones, A. P. Rollett, V. J. Stone, A. H. R. Tregaskes, C. H. Watson; (Apr. 10) L. H. Cawte, B. Jones, N. R. Kerr, C. L. Spurr, F. A. Thompson.

The notifi. of Mar. 28 concerning J. Anderson is cancelled.

Equipment Branch.

The follg. P/Os. are granted war subvise. rank of F/O.:—(Mar. 1) J. H. Becker, J. K. Slater; (Mar. 24) A. G. Adamson, E. A. Ball, J. F. Cardno, P. D. May, E. O. V. Mulley, E. G. Plum, R. O. Sampson, W. G. Turnbull.

Accountant Branch.

The follg. Act. P/Os. on probn. are graded as P/Os. on probn.:—(Jan. 4) A. R. Mathewson; (Mar. 7) J. A. Whittaker.

The follg. P/Os. are granted war subvise. rank of F/O.:—(Feb. 18) A. D. Goodliffe; (Mar. 9) J. B. Sifford; (Mar. 11) D. R. Lund; (Mar. 29) E. W. B. Lewis.

Medical Branch.

The follg. are granted commns. for duration of hostilities as F/Os.:—(Feb. 28) P. A. Dawes, M.R.C.S., L.R.C.P.; (Apr. 1) A. D. Macdonald, M.D., Ch.B., E. W. Jones, M.B., Ch.B., M.R.C.S., L.R.C.P., H. L. B. Girvan, M.B., B.Ch., M. T. Gallagher, M.B., B.Ch., L.M., E. S. Fraser, M.B., Ch.B., M.R.C.S., L.R.C.P., J. G. Smith, M.B., Ch.B., J. Tolland, L.R.C.P. & S., A. L. Waiby, M.B., B.Ch., R. B. Walker, M.R.C.S., L.R.C.P., R. A. Mitchell, M.B., Ch.B., M. L. Mason.

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MAY 15TH, 1941

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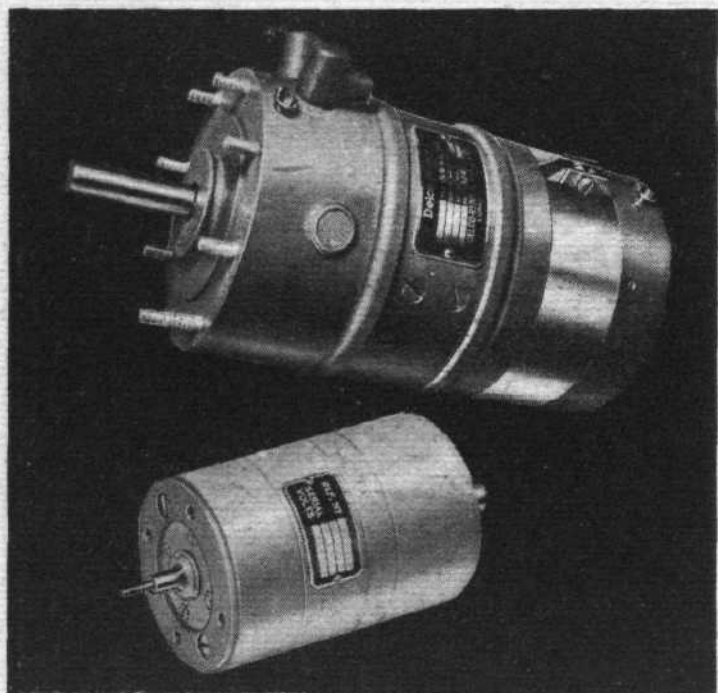
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The follg. F/Os. are promoted to war substantive rank of Flt. Lt.:—(Feb. 27) J. C. Hill, B.M., B.Ch.; (Mar. 5) H. B. Sutton, M.D., B.Ch.; (Mar. 26) G. Shneerson, M.B., B.S., M.R.C.S., L.R.C.P.

Dental Branch

The follg. are granted commus. for duration of hostilities as F/Os.:—(Apr. 1) T. Stirling, L.D.S., M. A. S. Harrington, L.D.S., M. J. Middleweek, L.D.S., G. W. Vincent, L.D.S., J. C. McDougall, L.R.C.P., L.R.C.S., L.D.S., C. Butzkie, L.D.S., H. L. Thomas, L.D.S., W. Campbell, L.D.S., J. R. Pinder, L.D.S.

Auxiliary Air Force

Administrative and Special Duties Branch.

P/O. H. P. Taylor is granted war substantive rank of F/O. (Mar. 21).

P/O. H. C. W. Miles (since promoted) is transf'd. to Technical Branch (Sept. 9, 1940).

Auxiliary Air Force Reserve of Officers

General Duties Branch.

F/O. P. A. Dawes relinquishes his comm., on appt. to a comm. in R.A.F.V.R. (Feb. 28).

Erratum.

In notifi. of Apr. 11 concerning F/O. A. P. Gray. For Feb. 16, 1941, read Feb. 16, 1940.

Women's Auxiliary Air Force

The follg. are apptd. Assist. S/Os.:—(Apr. 19) A/CW.2 J. L. Barber, Cpl. K. M. S. Burney, A/CW.2 S. K. Churchill, A/CW.2 B. M. Clarke, Sgt. N. R. Cooper, A/CW.1 H. K. Little, A/CW.2 E. J. Phillips, A/CW.1 M. M. Russell, Cpl. J. Surry, Dane, A/CW.2 O. Turner, A/CW.2 N. Villiers; (Apr. 21) Mrs. L. M. Evans, A/CW.1 J. M. Badgery, Cpl. F. E. Ball, Sgt. J. L. Beck, Cpl. S. M. J. Bowring, Sgt. P. B. Carpenter, Sen-Sgt. R. Cazes, A/CW.2 P. M. F. Cowdy, Cpl. B. M. Cox, Cpl. I. M. Craig, Sgt. S. Eiloart, Sgt. T. A. Fitzgerald, Sen-Sgt. E. Francis, Cpl. B.

Gillett, Cpl. E. Hay, Sgt. M. M. Herbertson, A/CW.1 M. N. Holden, A/CW.1 B. J. Hulton, A/CW.2 I. L. Humphreys, Cpl. E. A. Leathart, Sgt. B. E. Leigh-Smith, A/CW.1 G. D. Lloyd, A/CW.2 D. Mackey, A/CW.1 B. E. S. Malcolm, Cpl. S. Ottaway, Cpl. M. B. Parsons, Cpl. E. M. Potts, A/CW.2 E. A. Preston, Cpl. E. M. Ramage, Cpl. R. H. Schofield, Sgt. M. L. Scott, Cpl. C. F. Seabrook, Sgt. J. M. Spencer, Cpl. A. V. Stanley, A/CW.1 D. E. W. Stokes, Sgt. J. Stringer, A/CW.1 B. H. Thatcher, A/CW.2 C. M. Tolhurst, A/CW.2 M. L. Wareham, A/CW.1 R. Westlake-Wood, Cpl. P. M. White, Cpl. T. E. Wigfield, Sen-Sgt. M. C. Wilcockson, Sgt. V. T. Williams, Cpl. G. E. Wyatt.

Assist. S/O. E. F. Carr relinquishes her appt. on account of ill-health (Mar. 20).

Erratum.

In notifi. of Mar. 7 concerning the follg. For Feb. 22, 1940, read Feb. 22, 1941:—A/CW.1 A. M. S. Allan, A/CW.2 Y. J. Campbell-Brace, Sgt. N. Colville, A/CW.1 J. MacA. Donald, Cpl. K. L. Hay, A/CW.2 J. A. Heath, A/CW.2 J. Kent, A/CW.2 V. M. Mitchell, A/CW.2 E. L. Murray, Cpl. J. Peel Nash, A/CW.1 K. C. H. Powell, A/CW.1 M. A. Webster, A/CW.1 A. Wickham.

AERONAUTICAL PATENT SPECIFICATIONS

16088. AUTOMOTIVE PRODUCTS CO., LTD., and THORNHILL, P. W. Mechanism, particularly for the retractable undercarriages of aircraft (529,460).
16277. CURTISS-WRIGHT CORPORATION. Control structures for aircraft (529,537).
16342. BOSCH GES., R. Starting-apparatus for internal-combustion engines of aircraft and other vehicles (529,553).
16448. WOCHER, M., FLUCK, F., and NIEDERMANN, J. Method of fighting aircraft from other aircraft, and means for carrying into effect this method (529,623).

(Published December 26, 1940.)

30602. BRANDENBURGISCHE MOTOREN-WERKE GES. Apparatus for the suspension of aircraft driving mechanism enclosed within a cowl (529,705).
14827. POTEZ, H. C. A. Flap device for cowlings of air-cooled aviation and other engines (529,723).
15663. BLACKBURN AIRCRAFT, LTD., and JOHNSON, J. B. E. Control of variable-pitch airscrews (529,783).
16937. SELIGMAN, R. A. L. Frame for aircraft engines (529,859).
17057. ARMSTRONG WHITWORTH AIRCRAFT, LTD., SIR W. G., and LLOYD, J. Ailerons of aeroplanes (529,892).
17182. AIRSPEED (1934), LTD., TILTMAN, A. H., ELLISON, A. E., and TEW, R. SMALLMAN. Means for guiding control cables for aircraft (529,938).

(Published January 2, 1941.)

33457. FAIREY AVIATION CO., LTD., and HETHERINGTON, J. Retractable gun mountings (530,045).
- FAIREY AVIATION CO., LTD., and HETHERINGTON, J. Distant control of guns.
13098. UNITED AIRCRAFT CORPORATION. Speed control of engines for synchronous operation (530,111).
17532. PANIZZA (nee COLOMBO), VEUVE, V., COLOMBO, F., COLOMBO, P. A., and COLOMBO, L. Apparatus for dropping bombs from aeroplanes (530,075).

(Published January 9, 1941.)

7698. AMIOT, F. Aircraft (530,306).
7739. GRAY, W. E. Aeroplane stabilising and control means (530,598).
13612. AUTOMOTIVE PRODUCTS CO., LTD., and SIMPSON, J. K. Mechanism for producing angular movement for use in retractable landing gear for aircraft (530,373).
14084. IMBER, J. Aerial bombs (530,442).
16843. PRICE, N. C., and BOEING AIRCRAFT CO. System for heating a space such as an aircraft cabin subject to supercharging (530,320).
16846. PRICE, N. C., and BOEING AIRCRAFT CO. Heating systems more particularly for aircraft (530,321).
16988. POTEZ, H. C. A. Aircraft engine mounting (530,385).
17058. ARMSTRONG WHITWORTH AIRCRAFT, LTD., SIR W. G., and LLOYD, J. Facilitating the landing of aircraft (530,386).

17059. ARMSTRONG WHITWORTH AIRCRAFT, LTD., SIR W. G., and LLOYD, J. Landing-gear of aeroplanes (530,387).
17060. ARMSTRONG WHITWORTH AIRCRAFT, LTD., SIR W. G., and LLOYD, J. Landing-gear of aeroplanes (530,388).
18118. RIBBESFORD CO., LTD., and ONIONS, J. H. Roller bearings particularly for aircraft shock absorbers (530,342).
18278. PRICE, N. C., and BOEING AIRCRAFT CO. Boilers for aircraft-heating systems (530,361).
18538. BOBERG, J. A. Screw propellers (530,488).
18662. JUNKERS FLUGZEUG-UND-MOTOREN-WERKE AKT.-GES. Utilisation of the exhaust gas energy of aircraft engines for propulsion purposes (530,542).
18663. JUNKERS FLUGZEUG-UND-MOTOREN-WERKE AKT.-GES. Utilisation of the exhaust gas energy of aircraft engines for propulsion purposes (530,543).
18664. JUNKERS FLUGZEUG-UND-MOTOREN-WERKE AKT.-GES. Utilisation of the exhaust gas energy of aircraft engines for propulsion purposes (530,544).
18743. WITTMAN, S. J. Aeroplane landing-gear (530,561).

(Published January 16, 1941.)

17537. BAYERISCHE MOTOREN WERKE AKT.-GES. Lubricating device for aircraft engines (530,631).
17558. MILNER, H. L. Variable-pitch airscrews for aircraft (530,633).
18955. JUNKERS FLUGZEUG-UND-MOTOREN-WERKE AKT.-GES. Driving arrangements of aircraft engines (530,717).

(Published January 23, 1941.)

19198. FAIRBROTHER, H. (BAYERISCHE MOTOREN WERKE AKT.-GES.). Cooling of air-cooled radial-cylinder aircraft engines (530,991).

19833. BUDD MANUFACTURING CO., E. G. Aeroplane wing constructions (530,954).
20223. ETABLISSEMENTS GUILLOT-PELLETIER FILS ET JOUFFRAY SOC. ANON. Lifting-stands, more particularly applicable to aircraft (531,110).

(Published January 30, 1941.)

8856. EVANS, A. T. Variable-pitch airscrews (531,241).
9681. SPERRY GYROSCOPE CO., INC. Control or regulating devices such, for example, as automatic pilots for craft (531,388).
10140. DOWTY, G. H. Hydraulic actuating systems for aircraft and the like (531,465).
14066. SPERRY GYROSCOPE CO., INC. Automatic pilots for aircraft (531,390).
19016. BENDIX AVIATION CORPORATION. Indicating-instruments (531,197).
20573. WARREN, S. F. (HENSCHEL FLUGZEUG-WERKE AKT.-GES.) Air- and gas-tight wall lead-through for electric wiring systems, particularly in high altitude aircraft (531,228).
20780. VEREINIGTE DEUTSCHE METALL-WERKE AKT.-GES. De-icing apparatus for the airscrews of air-cooled aircraft engines.
20986. DORNIER-WERKE GES., and DORNIER, C. Aircraft fuselages (531,357).
21189. TAPIER R. Aircraft (531,411).
21544. ELIOT, S. Exhaust-silencers for internal-combustion engines of aircraft or motor vehicles (531,507).

(Published February 6, 1941.)

10138. AIRCRAFT COMPONENTS, LTD., DOWTY, G. H., and BRIDGES, D. G. Retractable alighting-gear for aircraft (531,750).
13670. MATTEUCCI, R. Device for carrying out aerodynamic braking operated by reversal of the pitch of propellers with variable pitch during flight (531,819).

PUBLICATIONS RECEIVED

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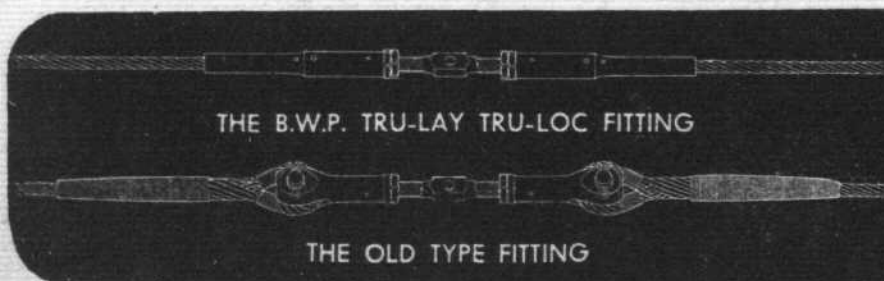


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