

BRITAIN'S AERO ENGINES (CONTINUED)

including the piston and connecting rod assemblies, follows normal Bristol practice. However, inside the crankcase front cover, in place of the familiar cam sleeve and tappet assembly, there is driven by the crankshaft a simple train of spur gears by which rotation at half engine speed is given to nine small sleeve cranks. These have their bearings in the crankcase and the front cover respectively, and their crankpins protrude rearward inside the crankcase front wall. Here each crankpin engages through a spherical and sliding coupling with the lug of its appropriate sleeve valve, which is a steel tube telescoping between the piston and the cylinder.

Due to the rotation of the sleeve crankpin at half engine speed, the sleeve valve receives a motion which combines reciprocation and partial rotation. This combined motion is such that any given point on the sleeve describes the path of an ellipse wrapped round the circumference of the sleeve and completes this closed circuit once every two revolutions of the crankshaft.

Four specially shaped ports are disposed around the circumference of the sleeve near the top. At the correct points of the cycle for inlet and exhaust these ports, due to the motion of the sleeve, traverse similar ports cut in the walls of the cylinder, progressively enlarging and then closing the resulting passages from within the sleeve to the inlet or exhaust manifold.

During the high-pressure portions of the compression and firing strokes the sleeve is at the top of its path, and its ports have risen above the level of two sealing rings in the cylinder head or "junk head." The "junk head" extension, somewhat resembling an inverted piston, protrudes into the bore of the sleeve sufficiently for this purpose. Two sparking plugs are fitted in the smooth, slightly convex face of this extension, which forms the roof of the combustion chamber.

Since the "junk head" contains a fairly deep pocket corresponding with the extension which enters the sleeve, the bottom of this pocket would ordinarily be out of the direct flow of the cooling air. An ingenious arrangement of finning and cowling, however, ensures that an air current is continually induced through it. The small splayed cowl, which is fixed to the top of each head, has rubber edges forming a seal with the ring cowling of the engine. Air is deflected by this cowl down into the pocket over the cooling fins inside and out at the rear of the head.

Construction

The cylinders are machined from light alloy forgings and the "junk heads," machined from die castings of similar material, are each fixed to their cylinders by twelve studs and nuts. Each of the nine induction pipes has a manifold embracing half the diameter of the cylinder. The latter has three inlet ports which are progressively served by the sleeve inlet ports. The two exhaust ports of each cylinder are connected by short pipes to the exhaust ring.

Apart from the fully automatic Claudel-Hobson carburetter the engine embodies another important feature—a remote gear box for all auxiliary drives except those for the magnetos, oil-pump, dual feed pump, tachometer, electric starter and, if required, the governor for the constant-speed airscrew control.

Recent engines in the Aquila, Perseus, and Hercules series include the Aquila A.E. (3M) (moderately supercharged), Aquila (A.E. 3S) (fully supercharged), Hercules II (moderately supercharged), Hercules HE (1SM) (two-speed supercharger), Hercules HE (4M) (moderately supercharged), and Hercules HE (5M) (moderately supercharged). Data for the Aquila IV are given in the table on page 390.

For a diameter of only 46 in. and a capacity of 15.6 litres this engine gives 600 h.p. for take-off at 3,000 r.p.m. and is normally rated at 470 h.p. at 4,500 ft. A fully supercharged unit of the Aquila series was installed in the Vickers Venom single-seater fighter and was applauded particularly for its smoothness.

MAKERS: *The Bristol Aeroplane Co., Ltd., Filton, Bristol.*

BRITISH ANZANI

DU^E to the rush of sub-contract orders and the fact that a new type of light aero engine is in the design stage, The British Anzani Engineering Co. has discontinued the production of its vee-twin unit.

MAKERS: *British Anzani Engineering Co., Ltd., 72/74, Windmill Road, Hampton Hill, Middlesex.*

BRITISH WALTER MIKRON

BE^{FORE} many months have passed a British version of the Walter Mikron inverted four-in-line unit with a normal output of 60 h.p. at 2,000 r.p.m. should be in production at the Opperman works.

Sales will be handled by The Chrislea Aircraft Co., Ltd., Heston Airport, Middlesex.

MAKERS: *S. E. Opperman, Ltd., North Circular Road, London, N.W.10.*

CAUNTER

MR. C. F. CAUNTER has evolved a new design, which he calls the type D, for an engine intended for the Civil Air Guard. He explains, however, that on account of the complete lack of interest in two-stroke aero engines in this country it is unlikely that a prototype will be built.

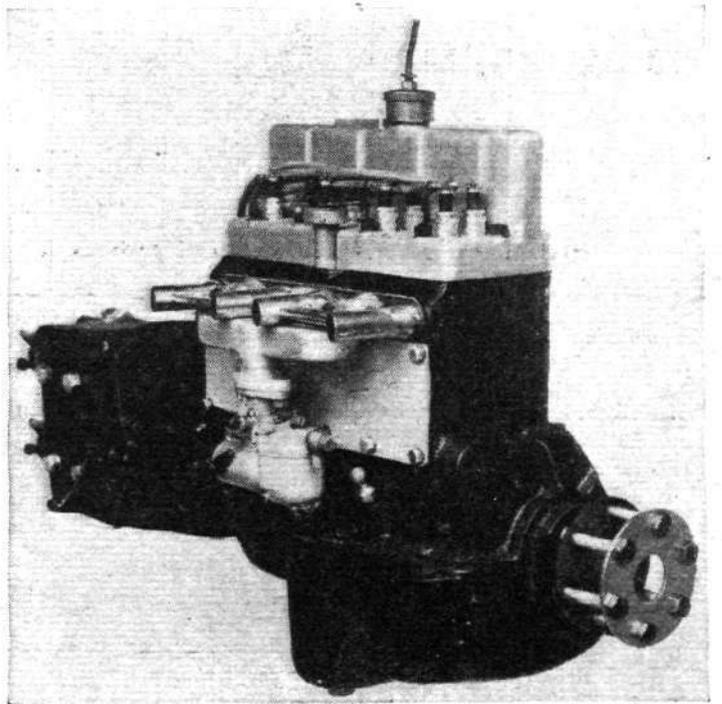
The engine is a three-cylinder inverted in-line air-cooled two-stroke with a maximum output of 50 h.p. at 2,700 r.p.m. and weighing 100 lb. The capacity is 1.9 litres. Mr. Caunter believes that it could be produced in quantity at about £65 retail.

MAKER: *C. F. Caunter, "Chryscum," Salisbury Road, Farnborough, Hants.*

CHILTON

AN adaptation of the Ford Ten car engine, the little Carden unit offered by Chilton aircraft has a large thrust bearing, optional dual ignition and various other modifications required for use in aircraft. Incidentally, it should be explained that the header tank shown on the cylinder head in the accompanying photograph is optional and is not used in that position on the little Chilton monoplane as it would interfere seriously with the cowling lines.

In spite of the weight of the engine at least two manufacturers have changed over to it from two-cylinder types



In this view of the little Chilton (Carden) water-cooled "four" the header tank is seen over the cylinder head. This is an optional position.