

CZECHOSLOVAKIA

J. Walter & Co.

AMONG the foreign engines Czechoslovakia is represented by the firm of J. Walter & Co., Ltd., of Prague, who are showing four of their air-cooled radial engines. Walter engines are in use in every country in Europe and also in America, but are not perhaps so well known here as they deserve to be. The engines shown include three of a new series in which the cylinders, pistons, valve gear and other components are interchangeable, these engines being the five-cylinder 85 h.p. Vega I, the seven-cylinder 110 h.p. Venus I, and the nine-cylinder 145 h.p. Mars I. The fourth exhibit is the seven-cylinder 240 h.p. Castor, also a new engine similar in general construction to the three previously-mentioned, but of larger dimensions. All four are of the direct-drive normally-aspirated type.

The three engines of the same series all have a bore and stroke of 105 mm. and 120 mm. respectively and a compression ratio of 5.15 : 1, the normal and maximum crankshaft speeds being 1,750 r.p.m. and 1,800 r.p.m. respectively. The normal and maximum outputs are 85 and 90 b.h.p. (Vega), 110 and 115 b.h.p. (Venus), 145 and 150 b.h.p. (Mars).

The cylinders are of composite construction having steel barrels turned from the solid forging, to which are screwed cast aluminium alloy heads. The barrels are secured to the crankcase by flanges, studs and nuts. An unusual feature is that the heads are intended to be detachable without removing the whole cylinder from the crankcase, as they are assembled cold and do not therefore make the more usual permanent assembly. Each head is secured by a halved ring which is clamped around the lower end by two bolts. Each head is provided with two bronze valve seats, guides and sparking plug adapters, the latter being located horizontally at the front of the head. The valve rockers have roller pivot bearings, the spindles being mounted in brackets which are secured directly to the head. It is of interest to note that even on their largest engine no attempt has been made by this firm, to compensate the valve gear to allow for cylinder "growth," the makers having carried out exhaustive tests, to prove the necessity or otherwise for incorporating this refinement, and that they only decided against doing so when they were thoroughly satisfied that the "growth" was proved to have a negligible effect. Each valve is fitted with double concentric springs, whilst detachable sheet metal covers of the helmet type enclose the whole of the valve gear. In the five- and seven-cylinder engines a single cam ring is used, this being driven through the usual train of gears. The crankcase is split on the plane containing the cylinders, the long securing bolts serving also to anchor the engine to its mounting plate.

The crankshaft is of the two-piece type, the master rod big-end being in one piece and mounted on the crankpin on two roller bearings. The aluminium alloy pistons are secured to the tubular auxiliary rods by fully floating gudgeon pins, these working in bronze bushes. The crankshaft is supported by three ball bearings, one against each crank web, whilst a deep groove ball bearing at the forward end of the shaft acts as a combined thrust and journal bearing. All the auxiliary drives are located at the rear of the crankcase. The oil pressure pump is of the adjustable plunger type of special design, as it also acts as the scavenger. Provision is made for the fitting of the gas distributor of the Viet starting system.

In the five and seven-cylinder engines a Zenith type 50 J carburettor supplies mixture to an annular induction chamber formed in the rear portion of the crankcase, from which the mixture passes to the rear of the heads by the usual induction pipes. On the nine-cylinder engine a duplex Zenith type 42 DCI carburettor is fitted. In each case the carburettor is mounted in an accessible position below the rear half of the crankcase. The two Scintilla magnetos are mounted on brackets cast integral with the rear cover, their spindles being in the fore-and-aft sense and parallel to each other, with the distributors facing forward. The weights of these three engines are 226 lb., 393 lb. and 350 lb. for the five, seven and nine-cylinder types respectively.

The seven-cylinder Castor has a bore and stroke

of 135 and 170 mm. respectively, and a compression ratio of 6 : 1, the normal output being 240 h.p. at 1,750 r.p.m. The output at ground level at a maximum speed of 1,850 r.p.m. is 260 b.h.p., but the full throttle power is 340 b.h.p. at ground level, thus the engine has a power reserve of nearly 40 per cent.

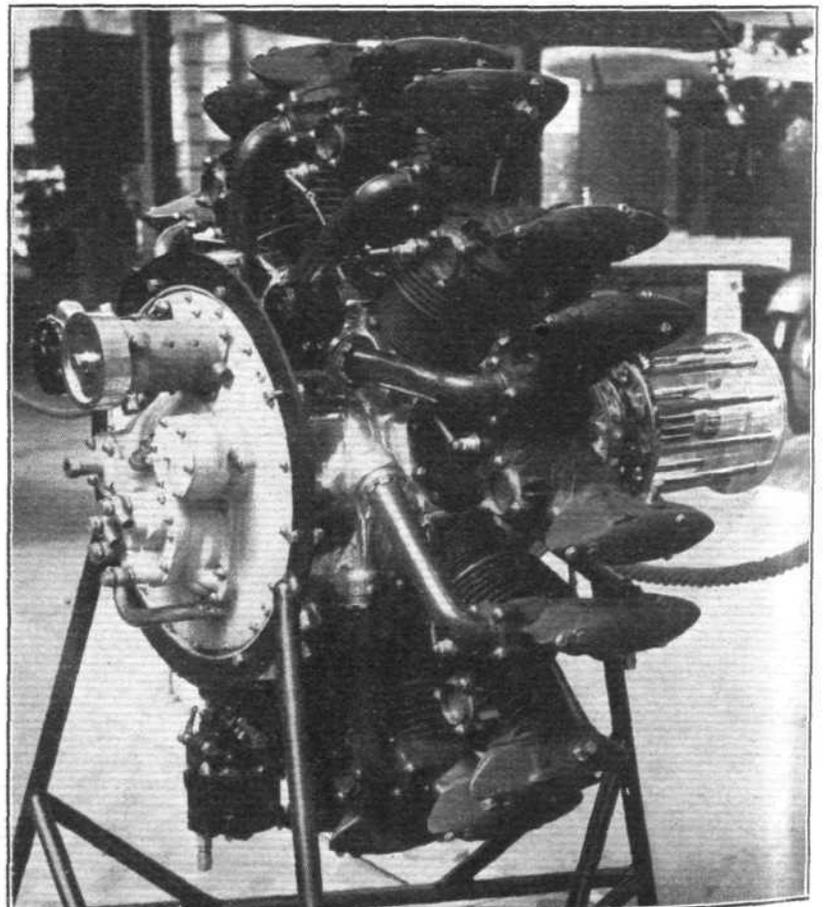
The cylinder construction and valve gear is the same as that of the smaller engines, with the exception that triple concentric valve springs are fitted and the inlet and exhaust tappets are operated by separate cam rings. Roller bearings are used for the master rod big end and for the support of the two-piece crankshaft, a separate thrust bearing being provided. In this engine all the auxiliary drives are located at the rear, excepting those of the two Bosch or Scintilla magnetos, these being mounted transversely on brackets cast integral with the front cover. The magnetos are bevel driven by the intermediate gear spindle in the cam ring driving train. The induction system has also been modified, a Zenith type 60 D.C.J. twin-choke carburettor supplying the mixture through two pipes to a separate induction chamber bolted to the rear of the crankcase, this chamber housing a distributing fan. Both the induction chamber and the carburettor are jacketed by the warm oil on its return from the scavenge pump to the oil tank. The oil pressure and scavenge pumps are of the gear type in this engine. The auxiliary drives include a connection for the generator supplying the electrical equipment of the aircraft, revolution indicator, gas starter distributor and fuel pump. The weight of the Castor engine is 550 lb., including the air-screw hub.

FRANCE

FRANCE is well represented at the Show by five firms, the number of French engines exhibited totalling 22, divided as follows:—three Hispano-Suiza (all water-cooled), two Farman (one air- and one water-cooled), five Lorraine (two air- and three water-cooled), six Renault (two air- and four water-cooled), and finally, six Salmson, all air-cooled.

Farman

Two Farman engines are exhibited on the Farman Stand, one being an inverted 600-h.p. eighteen-cylinder water-cooled broad arrow type, whilst the other is a nine-cylinder air-cooled radial of 250 h.p. Both are fitted with the Farman reduction gear. The 18 WI, or water-cooled engine, was



The Farman 9-cylinder radial air-cooled engine is fitted with reduction gearing, and develops normally 250 b.h.p. at 2,500 r.p.m.