



The off-set induction pipe on the Walter Sagitta I and II gives the impression of a wide angle between banks. It is, however, 60 deg., as in most vee-type engines.

Bloch and Morane, are now equipped with these engines.

Renault produce a larger engine giving 680 h.p., while Lorraine are represented in this nine-cylinder category by the 9Ab of 180/230 h.p. and the Algol Major, which is rated at 420 h.p., both being unsupercharged types.

The latest form of Armstrong-Siddeley Cheetah IX engine gives 310 h.p. rated output and 350 h.p. maximum. It is fitted for a Ratier constant-speed airscrew, although, as for the Airspeed Trainer, a D.H. variable-pitch airscrew can be used.

Well established in the same class, the Gnome Rhône Titan Major is rated at 12,100ft. to give 360 h.p., while the Lorraine Mizar Major of 16.163 litres capacity has an output of 300 h.p. at sea level. Of the smaller radial sevens, Farman 7EAR, 7EAs and 7ED are of 150, 170 and 170 h.p. respectively; the EAR is rated at sea level and the supercharged EARs at 4,000ft., while the ED is the direct-drive version of the EAR. A single radial seven appears in the Walter list of sixteen models—the 17-litre Castor II rated at 275 h.p. and giving 300 h.p. at 3,280ft. and 2,000 r.p.m.

Several neat lightweight power units are displayed at the Show, arrangement varying from a radial three of 3½ litres capacity giving 60-70 h.p., produced by Lorraine under Potez licence, to an inverted in-line twin, four and six shown by Train. These last named engines, known as the 2T, 4T and 6T, have their parts standardised, the rated powers being 20-25, 40-50 and 60-70 h.p. The valves are operated by underhead camshafts with rear drive and the aluminium-bronze heads are detachable. The 60-70 h.p. 6T powers the S.F.A.N. 5.

Regnier offer a horizontally opposed, air-cooled twin giving 62 h.p. at 2,500 r.p.m. Valves and push-rods are uncovered and the whole design appears very simple. This firm also manufactures two small inverted in-line fours of 50 and 85 h.p.

**Two-strokes**

A.V.A. show in the latest forms their air-cooled flat four two-strokes of 25-30 and 35-40 h.p.; the engines differ only in the bore being increased by 10 mm. to 80 mm. in the larger one. The Farman Moustique is powered with an Ava engine or Mengin flat twin, and examples of both are displayed.

The Czechoslovakian Walter Atom 1.1 litre flat twin has a finned oil compartment under the crankcase, and also two carburetters and dual ignition; the output is 28 h.p. maximum at 3,000 r.p.m. On the same stand are the Mikron and Minor inverted fours; two of the latter engines, as a pusher installation of 85-95 h.p. each, drive the Praga E.210. The Mikron of 2.18 litres capacity has a maximum output at 2,800 r.p.m. of 55 h.p.

Perhaps the most interesting six-cylinder engines

(Upper right) An addition to the Lorraine series, the Sterna gives 810 h.p. at 2,575 r.p.m. (Right) It is not surprising, in view of its layout, that this twelve-cylinder Lorraine is unique at the show. The supercharger is just visible, placed horizontally underneath.

are made by Renault. In supercharged or normally aspirated form, the Bengali 6Q-00 and 6Q-04 give 220 h.p. at sea level and 13,100ft. respectively; the four-cylinder Bengali P.ei. and Junior are of 140-150 and 100-103 h.p. rating. Specially modified for the Coupe Deutsch race, the Renault 8-litre six-cylinder Coupe Deutsch engine has a normal output of 360 h.p. The cylinder heads are heavily finned. One Stromberg carburetter feeds a very neat blower situated behind the crankcase, but the Bengali range are fitted with Zenith carburetters.

On the Regnier stand may be seen the 180 h.p. R.6, together with several four in-line types closely resembling D.H. Gipsy Major; the R.6c is a new departure, with a rated altitude of 13,100ft. when the output is 250-310 h.p. at 2,600 r.p.m.; the Roots Blower turns at four times engine speed. The engine is the production form of the Coupe Deutsch unit and has a re-designed distributor and Zenith carburetter for inverted flying. The generator is neatly mounted between the magnetos. Separate aluminium bronze heads with finned exhaust ports are standard and a gas starter is fitted. The six-cylinder 7,971 c.c. Salmson is rated at 280 h.p.

The compact four-cylinder 82-90 h.p. Cirrus Minor and 135-148 h.p. Major Mark II represent this country in the light engine department.

Many manufacturers this year show newly developed inverted vee-type engines; the Salmson is a well arranged example, the twin underhead camshafts on each row having front inclined drives. The cylinder heads, which are cast in pairs, carry half the camshaft casing, while the exhaust ports are central in each head. The auxiliary drives are arranged for simplicity, the twin magnetos, mounted on top, using the same drive as the similarly mounted generator and compressor which they face. The 23:40 reduction gear is up-turned and the propeller boss is designed to take a canon. Long outside

