Among the new private-owner types was this attractive little side-by-side two-seater Oplinter monoplane, with Cirrus Minor engine.

type, with the fin mounted right forward of the tailplane and the whole of the rudder well above the level of the latter.

Power is provided by the Argus As.10 inverted vee-eight (air-cooled) of 240 h.p., giving a cruising speed of 255 km/hr. (158 m.p.h.) and a climb of 1,000 m. (3,050ft.) of four minutes.

The crew accommodation, which is laid out on remarkably generous lines for the size of the machine, allows half a dozen different types of instruction to be given—flying training, aerobatics, gunnery (there is a centrally placed fixed gun firing forward through the airscrew arc and a rear gun—with apparently a rather limited field—facing backwards out of the cockpit enclosure), radio, photography and bombing, in which last case the gunner lies prone.

Shown as a model is something of a curiosity, a Focke Wulfe single-seater fighter with a Jumo diesel. It is a parasol monoplane with a pair of spindly cantilever undercarriage legs that retract rearwardly into fuselage and traps that open to receive them. A speed of 250 m.p.h. is claimed.

A Klemm Kl.35 two-seater monoplane and the well-known Bücker Jungman trainer biplane complete the German full-scale exhibit.

Like the aeroplanes, the German engines are attractively displayed. The Hirth Company features its new 90/100 h.p. four-in-line, the H.M. 504A, which is a development of the well-known H.M. 60R, fitted to training types such as the Bücker. The Brandenburgische Motorenwerke, formed to take over the Siemens aero-engine interest, show their 160 h.p. seven-cylinder radial; and the Argus people have their inverted air-cooled vee-eight of 240 h.p., together with a big selection of components, from undercarriages downwards—or upwards.

Instrumental Novelties

One particularly noteworthy German accessory deserves mention—a range of A.S.I.'s and revolution indicators on rather novel lines. Taking the former as an example, it has only four cyphers on its face, 10, 20, 30, and 40, with normal calibrations between them, and the direction "km/h x 10in." Now, the hand having travelled once round the face, indicating from 60 to 450 km/h, it begins a second circuit in the same direction, whereupon the four figures on the face change to 50, 60, 70, and 80, thus giving a continued reading from 450 up to 850 km/hr. The Bruhn Company of Berlin are the makers.

The Askania instrument people have an amazingly comprehensive display, including their repeater compass. Askania products are shortly to be handled in England by Rollason's, of Croydon.

The presentation of the French exhibit compared unfavourably with that of the German. On a vast expanse of threadbare blue carpet were scattered haphazardly an assortment of aeroplanes and engines, all the former of familiar type and most of them looking distinctly air-worn, while some of the latter were also shabby, the airscrew shaft of one being generously blotched with rust.

The French aeroplanes are a Caudron Simoun (Renault), a Potez 58 three-four-seater high-wing monoplane, and a Salmson Cri-Cri two-seater parasol monoplane. *L'aviation militaire* is represented by the striking Morane 405 low-wing fighter which was at the Paris Show. Equipped with a Hispano 12 Ycrs *moteur canon*, it does 305 m.p.h. at 16,000-odd feet, and, judging by its appearance, had been doing it pretty consistently—which is more than could be said for some of the half-finished "hollow-mockeries" in the Show.

Labelled "*Avion de Represailles*," there is also the C.670, the military version of the Caudron Typhon, that Comet-like monoplane with two 220 h.p. Renaults. The normal armament consists of two 20 m.m. *canons*, a machine gun, and an internal bomb-load of 660lb.

The French engine exhibits include the 860 h.p. Hispano Ybrs liquid-cooled vee-twelve and 14 Aars fourteen-cylinder two-row radial of 1,150 h.p. and the Gnome-Rhone 14 M, a small-diameter fourteen-cylinder two-row radial giving 650 h.p. at 4,000 metres.

Czechoslovakia shows two aeroplanes. One is the Benes Mraz Beta minor, a nicely finished low-wing monoplane with trousered undercarriage, not unreminiscent of the Miles Hawk. Power is provided by a Walter Minor four-in-line of 85-90 h.p. The other is the Zlin XII low-wing cabin monoplane with 45 h.p. air-cooled flat-four Persy II engine.

There is a beautifully finished Walter Sagitta I twelve-cylinder, air-cooled, inverted vee, supercharged to give 500 h.p. at 1,600 m. and 520 h.p. at 2,000 m. Provision is made for a *canon*. A wire "cowling" surrounding the engine gives an excellent idea of the installation possibilities. The other Czech engine shown is the unconventional ZOD two-stroke diesel, built by the makers of the Bren gun. A nine-cylinder radial of 260 h.p., it has two exhaust valves per cylinder; air from a centrifugal blower enters ports as they are uncovered by the pistons, and fuel oil is injected at the top of the compression stroke. A weight-power ratio of 2.8 lb./h.p. would suggest the likelihood of considerable further development.

A New Fighter

Belgium, of course, has quite an impressive collection of aircraft. Of particular interest is the entirely new low-wing monoplane fighter, constructed by M. Alfred Renard of Evére, who has supplied a number of two-seater parasols in reconnaissance machines (the Renard R.31) to the Belgian Air Force. Mainly of duralumin construction, the R.36 is completely modern in conception. It is an enclosed-cockpit single-seater. Large fillets, of equal extent both at front and rear, cover the union of wings and fuselage. A Messier undercarriage retracts into the wings, but the tail wheel is not retractable. Armament consists of one *canon* (in the 910 h.p. Hispano Ycrs engine), four Browning guns—two in each wing—and eight 22-lb. bombs. With a Ratier three-bladed v.p. airscrew, a top speed of 505 km./h.p. (313 m.p.h.) is claimed at 4,000 m. (13,100ft.), a height which can be attained in 4m. 56s. Cruising speed is 400 km./hr. (248 m.p.h.).

One interesting detail is the neat mounting of the radiator in the underside of the tail, with a retractable scoop and a vent placed about three feet apart.

By contrast to this graceful monoplane the Renard stand also exhibits an affair which reminds one of a ship's boiler; actually it is a half-scale model of a pressure cabin for a 20-seater high-altitude machine which is to be constructed, one understands, for experiments by the Sabena line. A model of the complete machine completes the Renard exhibit.

Grouped together on another Belgian stand are three new light private types. One is the Mulot (Ateliers de Constructions Aeronautiques of Brussels) a single-seater parasol monoplane (or, more accurately, sesquiplane) of 7.40 metres (24ft. 3in.) span. The example shown has a Gipsy I engine, but subsequent examples will be designed for the 60 h.p. Train. The second is the Regnier (no connection with the French engine of that name), a low-wing side-by-side-seater of extraordinary size, and with an equally extraordinary amount of cockpit accommodation, considering that the engine is a four-in-line Train of only 40 to 50 h.p. The gross weight is

(*Concluded on p.* 564)