



**THE AVRO TYPE 529A.**—This is a sister 'plane to the type 529, but has two Galloway B.H.P. engines.

graphs shows these three machines lined up, the one on the left being the "Pike," that in the middle the Green engined machine, and the one nearest the camera the 529. The next machine to be tested was the

**Avro Two-Seater Fighter, Type 530.** July, 1917.

In many ways the 530 was a radical departure from usual Avro practice. Thus the engine, instead of the rotaries fitted in the type 504 machines, was a water-cooled—a 200 h.p. Sunbeam "Arab." Also the shape of the wing tips was totally different from the usual Avro rectangular tips with rounded corners. As regards the fuselage, this was very much deeper, and of different shape altogether from the ordinary Avro bodies. The object kept in view when designing this machine was to provide as good a view as possible for both gunner and pilot. To this end the body was made very deep, and the pilot was so placed that his eyes were on a level with the under side of the top plane. Similarly the gunner was placed very high in relation to the top plane, being in fact able to fire over it. It will be noticed that the attachment of the top plane to the body was unusual. A sort of fin was extended up from the body, covered with ply-wood, to which the centre section was attached. Inside this fin was mounted the pilot's machine gun, synchronised, of course, while the gunner's weapon was mounted on the usual rotatable gun ring. The undercarriage was of a simple Vee type, but forming a letter M, as seen from in front, and the two side Vees were enclosed in fabric. The machine was very light and quick on the controls, and the deep roomy fuselage afforded ample space for ammunition, wireless, cameras, etc. From the table of performances it will be seen that both speed and climb were very good indeed for the power, and this is of particular interest in view of the comparatively large cross sectional area of the fuselage—14 sq. ft.—which does not appear to have adversely affected the speed of the machine. Originally the Type 530 was designed for a 300 h.p. Hispano-Suiza engine, but as this could not be obtained the experi-

mental machines were fitted with 200 h.p. Sunbeam "Arabs" and 200 h.p. Hispano-Suizas.

**The Three-Seater Bomber, Type 529A.** October, 1917.

The reason for the apparent break in the series, by which the two-seater fighter, type 530, comes before the 529A, is to be found in the fact that these two machines were going through the works at the same time, and the type 530 was finished a short time before the other machine. The type 529A is a sister plane to the Rolls-Royce engined machine. From the table of performances it will be seen that both speed and climb of this machine were very good indeed, while at the same time she had a good range of action (556 miles at 10,000 ft.). She would therefore have made a good long-distance bomber, and should have been coming through in quantities in the spring and early summer of 1918. From the plan view of the machine it will be seen that the wings were arranged so as to be capable of being folded back, thus economising storage room. The pilot sat just ahead of the leading edge of the planes, while a gunner was placed in the nose of the fuselage, and another gunner well aft, whence he had a good field for his machine gun. The engines fitted were Galloway B.H.Ps., of 220 h.p. each. As shown in the illustrations the engines were very neatly covered in, and drove tractor screws, running in the same direction.

**The Avro "Spider," Type 531.** April, 1918.

The following spring saw an entirely different type of machine issue from the Avro works. This was a single-seater "Scout," in which the wing bracing was along quite unusual lines. From the illustrations it will be seen that, instead of the ordinary wing bracing wires or cables, the "Spider," as this machine was called, had Vee struts arranged in the form of a Warren truss. It may be remembered that in 1917 we published in FLIGHT a series of articles by "Marco Polo," entitled "Wing Bracing and Head Resistance," in which this particular form of wing bracing was dealt with.



**THE AVRO "SPIDER."**—Note the unusual strutting arrangement.