

# REALING "FLIGHT" DRAWINGS

The centre-section of the wing (below) is a single unit bolted to the fuselage at four points. It carries the retractable undercarriage.

Steel and duralumin take their place side by side in the Hurricane, each according to its suitability for a particular purpose. In the fuselage, for example, the longerons are steel tubes, but the diagonal struts which form the bracing in the sides are of duralumin in the rear portion.

Little need be said of the fuselage construction, which has been familiar for many years, beyond recalling that use is made of circular-section tubes for the longerons, this section being turned into a square section with rounded corners at the points where the struts are attached by flat plates and bolts or tubular rivets. The struts run zig-zag fashion between top and bottom longerons, so that there is no wire bracing, but the struts in the top and bottom panels run transversely, and bracing is by streamline tie-rods.

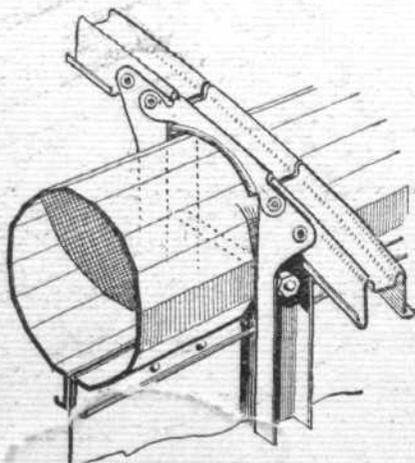
As the primary structure of the fuselage is of rectangular section, it has been necessary to add a secondary structure to give the rounded shape. This secondary structure

consists of wooden formers and stringers, the formers being attached to the longerons by metal clips, and the stringers carrying the fabric covering. The stringers are closely spaced, so that the external form is, strictly speaking, polygonal, although it approaches closely to a smooth section. This fabric covering extends from the sternpost to about the level of the pilot's seat. In front of this point the covering is in the form of light-metal panels which continue the smooth curves of the engine cowling.

From a practical point of view there is much to be said for the girder fuselage. Apart from the advantage, in the case of the Hawker company, of using a familiar form of construction, there is the question of installing the equipment, which is a complicated business in the modern military aircraft. Obviously in a small fuselage, such as that of a single-seater fighter, there is very little room for fitters or electricians to wield their tools, and to make the installation of equipment possible the design has to be so planned that either the fuselage is built in longitudinal sections, so that the men can reach in from each end, which introduces problems of connecting up the numerous pipe lines, electric leads, and so forth, or the fuselage has to be so constructed that the top portion forms a "lid," which can be left off until all the equipment has been installed. With the girder type a greater number of men can be concentrated on one fuselage, as they can reach into the interior between the members of the girder (the stringers, fabric and metal panels are, of course, left until most of the equipment has been installed and connected up).

The wing construction of the Hawker Hurricane is an ingenious adaptation of old methods to new requirements. In the old biplanes the spars were made of steel strip, with polygon-section booms and spanwise corrugated webs. The great depth necessitated by the cantilever wing of the Hurricane introduced certain problems, notably in connection with twisting stresses in the wing. In the biplane these are, of course, taken mainly by the incidence bracing.

Details of spar construction and wing rib attachment. The bridge piece is used over the rear spar only. Sheet metal covering is used over the leading-edge, and extends over the top of the front spar.



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