

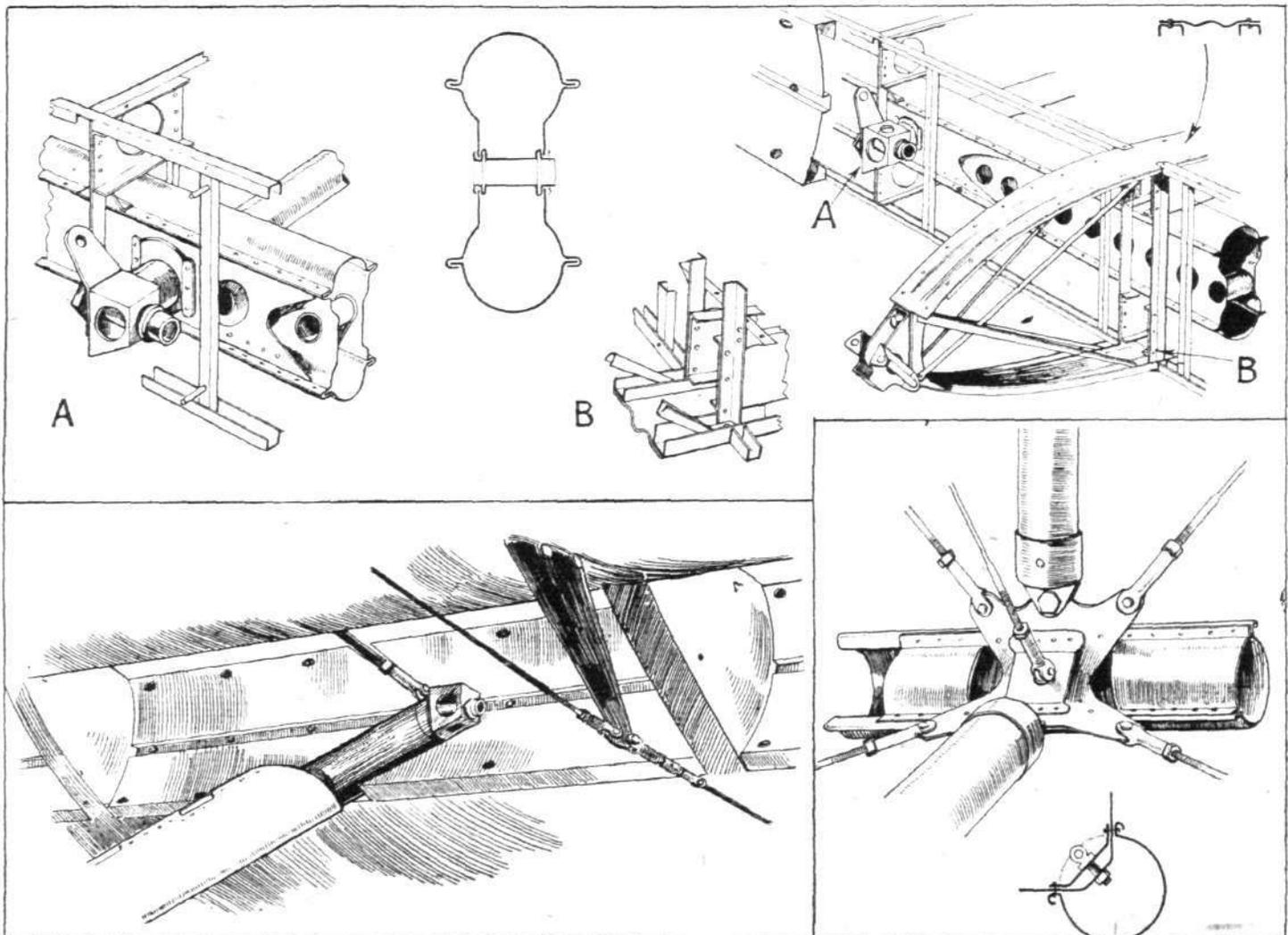


The Boulton and Paul "Bourges" all-metal machine is a long-distance reconnaissance three-seater. The engines are Napier "Lions."

Dealing with B. and P. metal construction first, it may be said that, up to the present at any rate, this is the only British firm which has entirely abandoned wood construction for metal. In this respect the firm occupies a position somewhat similar to those of Junkers and Dornier in Germany. The actual forms of construction are, however, entirely dissimilar, for whereas Prof. Junkers uses Duralumin entirely, and Dornier partly Duralumin and partly steel, Mr. J. D. North, chief engineer and designer to Boulton and Paul, uses nothing but high-grade steel. This material is used in corrugated sections rolled from flat steel strip, the corrugations having for their object to stiffen the sections against secondary flexure, thus approaching more closely to the ideal form which allows the full strength of the material to be developed.

In a set of sketches accompanying this article a few of the many various forms of rolled sections are shown. The wing

spars, for instance, are built up from two side strips and top and bottom flanges, the joining of the strips to the flanges being by steel rivets. The side strips are stiffened against lateral buckling by horizontal tubes, having narrow flanges formed on the inside of the strip, while the outer ends of the tubes are flanged over to lock the strips. The fuselage longerons, on the other hand, are of quite a different section, owing to the fact that they are to be regarded as struts, working in pure tension and/or compression, and not being required to carry lateral loads. Here a tubular section is the most economical, and a method had been developed by Boulton and Paul for manufacturing these approximately tubular members from flat steel strip, in place of the drawn steel tubes more usually employed. One of our sketches gives a perspective view of a typical fuselage joint, where the struts and bracing rods meet the longeron. The section and arrangement will be clear from the sketches.



EXAMPLES OF BOULTON AND PAUL METAL CONSTRUCTION: The upper sketches show the construction of wing spars and ribs, while in the lower right-hand corner is seen a typical fuselage fitting. On the left the bracing of the rear spar of the tail plane.