

AIRCRAFT CIRCULARS
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 124

THE WIBAULT 220 R.N. 3 AIRPLANE (FRENCH)
A Three-Place Observation High-Wing Monoplane

Washington
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THE WIBAULT 220 R.N. 3 AIRPLANE (FRENCH).*

A Three-Place Observation High-Wing Monoplane.

This three-place monoplane has a wing of cantilever type. It is all-metal, including the covering of the wing and fuselage (Figs. 1, 2 and 3).

The exterior form of the wing was determined by finding a family of profiles capable of giving it a simple geometrical shape and the best aerodynamic characteristics, and by adopting a tapered plan form reducing the structural stresses to a minimum. The relative thickness of the profiles decreases uniformly from the fuselage to the wing tips, so that at any point, the dimensions of the structural elements are proportional to the stresses to be withstood. The wing has two I spars rigidly joined by strong cross pieces which limit the torsional stresses and deformations. The cross bracing is reduced as much as possible, the covering helping to absorb the stresses. As shown in Figure 4, each wing spar consists of two T flanges with a sheet-metal web. Each rib is composed of four pieces.

The fuselage has a rectangular structure composed of duralumin shapes. It has a dorsal and a ventral cowling, the former being removable in two parts, so as to enable the rapid inspection of the controls.

The front part carries the cockpits for the navigator and the

*From L'Aeronautique, July, 1930, pp. 244-246.

pilot, as also for the machine gunner. The rear part carries the machine gun for firing under the fuselage and tail. The front part of the fuselage also contains the 735-liter (194 gal.) fuel tank.

The fuselage structure is illustrated by Figures 5-7. Figure 5 is a view of the under side of the fuselage showing the oval opening for the F.50 cm photographic camera in the metal plate connecting the two lower longerons. The central portion, in front of the opening, is covered with a floor of corrugated sheet metal. At the rear there is an opening for firing the machine gun under the fuselage. The bottom of the fuselage has an elliptical cowling. An opening permits the dumping of the fuel tank.

Figure 7 shows the openwork gussets permitting the passage of the controls.

The mechanism for regulating the stabilizer is shown in Figure 8. By means of a cable, the pilot operates the two-part pulley on the vertical shaft and the motion is converted by an endless screw into the rotation of the horizontal shaft visible under the front spar of the stabilizer. The vertical displacements of the spar are effected by an eccentric attached to the horizontal shaft. Figure 9 is an exterior view of the eccentric, showing also the "Tecalemit" oiler.

The dirigible Messier oleo-pneumatic tail skid is shown in Figure 10.

The engines are suspended from the central part of the wing, one on each side of the fuselage. They are supported by a system

of tubes serving also for attaching the shock-absorber struts of the landing gear. The two 420 hp Gnome-Rhone "Jupiter" engines are supported by mounts made of duralumin shapes and plates.

Details of the engine mount are shown in Figures 11-13.

Figure 11 shows the inside of one of the corners. It is a simple structure of metal plates, angles and gussets. The bolts for securing the engine pass through short cylindrical tubes of duralumin. Figure 12 is a general view of the mount and of its three-point attachment to the wing. Two fittings on the front spar receive the upper arms of the mount and two tubes. These tubes, with a third, supported by the rear spar, form a trihedral frame, to the top of which is attached the single lower plate of the mount and the Messier elastic strut, the details of which are shown in Figure 13. On the front of the mount there are four plates at 45° for receiving the cowling.

The landing gear is of the independent-wheel type and has long-stroke oleo-pneumatic brakes and a very wide track gauge.

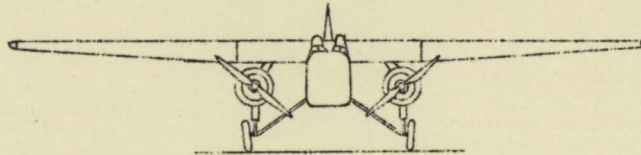
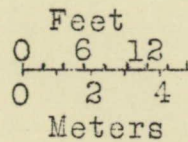
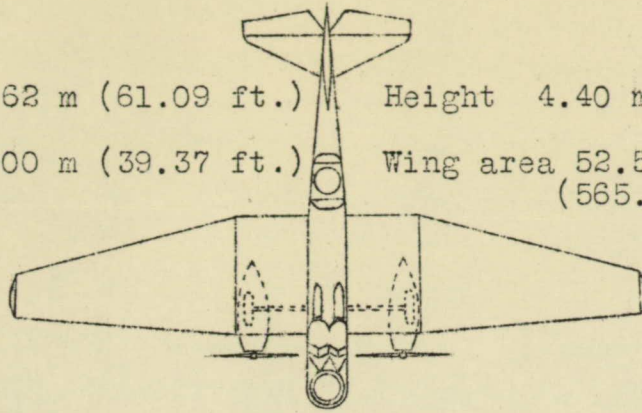
The tail surfaces are constructed on the same principles as the wing and are entirely cantilever. The symmetrical biconvex profile lifts well at large angles of attack and thus insures stability at all the regimes of flight.

C h a r a c t e r i s t i c s

Span	18.62 m	61.09 ft.
Length	12.00 "	39.37 "
Height	4.40 "	14.44 "
Wing area	52.50 m ²	565.1 sq.ft.
Weight empty	2746 kg	6054 lb.
Weight loaded	3450 "	7606 "

Translation by Dwight M. Miner,
National Advisory Committee
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Span 18.62 m (61.09 ft.) Height 4.40 m (14.44 ft.)
 Length 12.00 m (39.37 ft.) Wing area 52.5 m^2
 (565.1 sq.ft.)



Two 420 hp
 Gnôme-Rhône
 Jupiter
 engines.

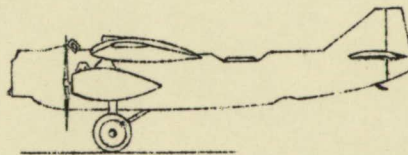
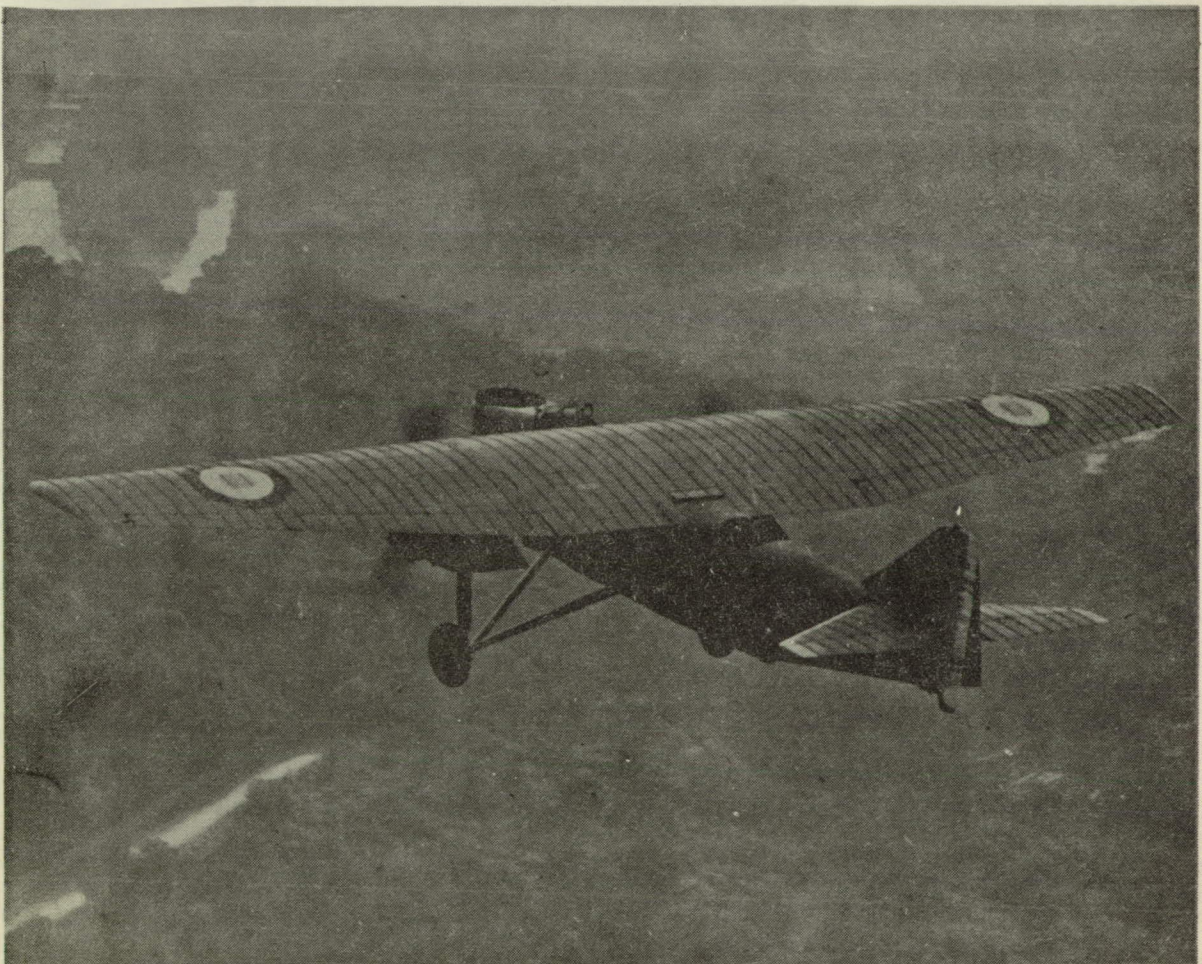


Fig.1 General arrangement drawings of the Wibault 220 R.N.3 airplane.



Figs.2 & 3 Views of the Wibault 220 R.N.3 observation airplane

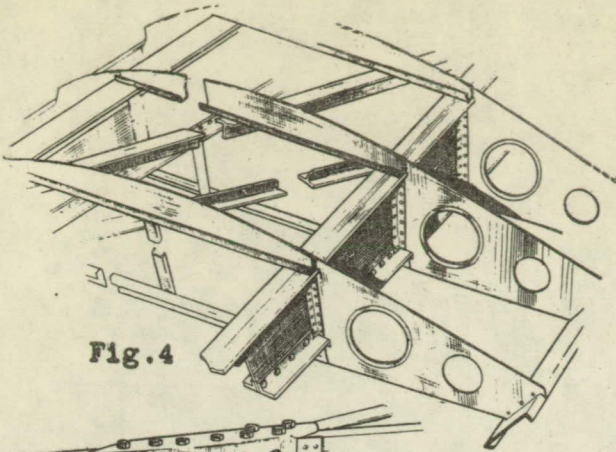


Fig. 4

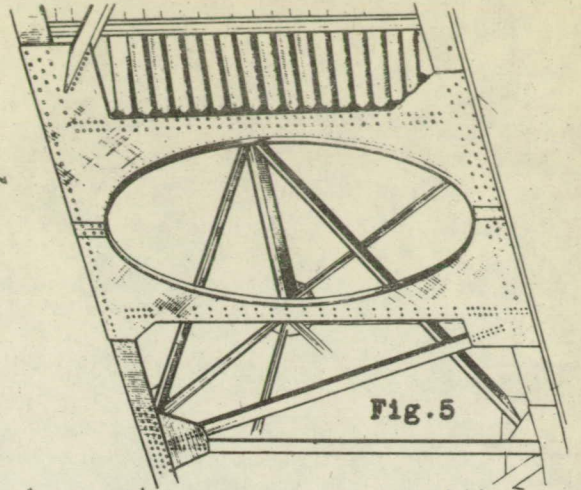


Fig. 5

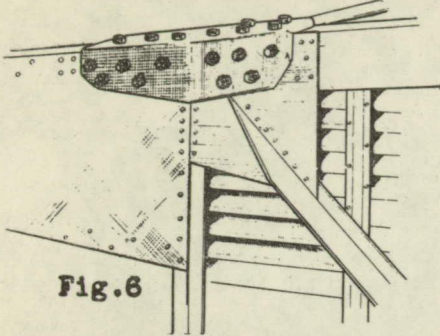


Fig. 6

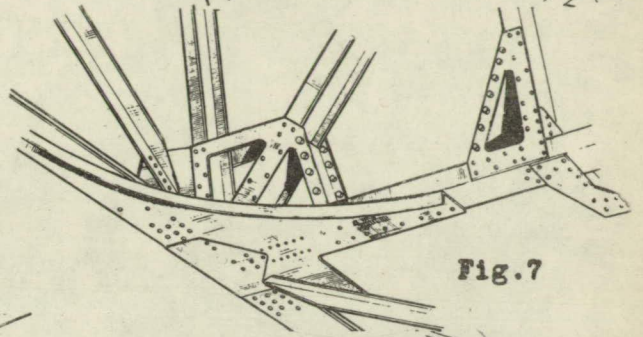


Fig. 7

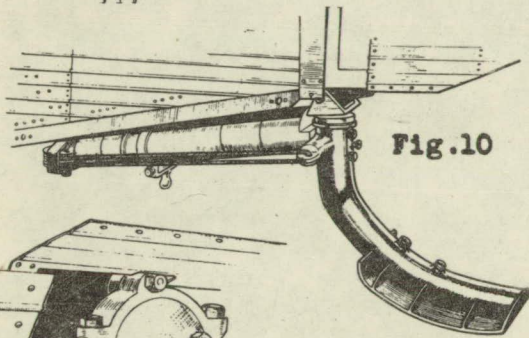


Fig. 10

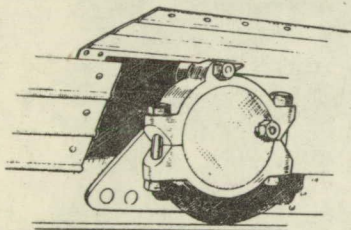


Fig. 9

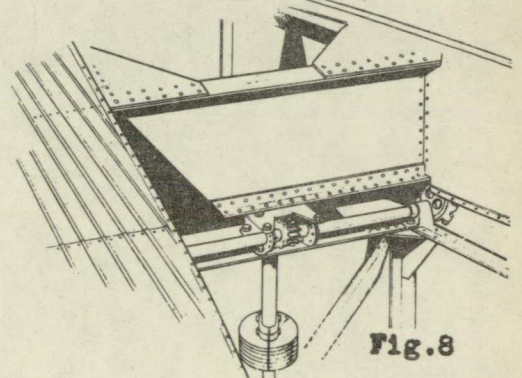


Fig. 8

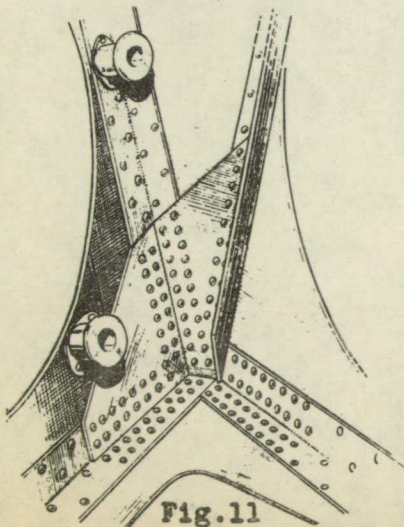


Fig. 11

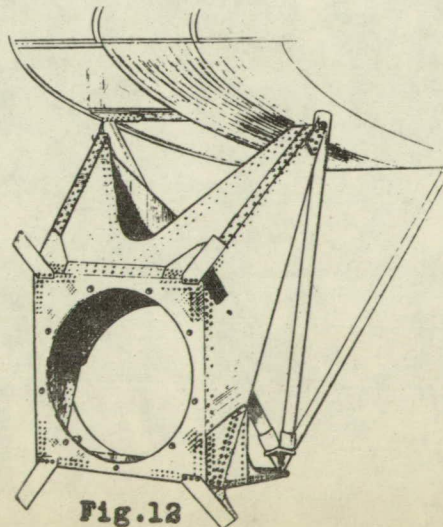


Fig. 12

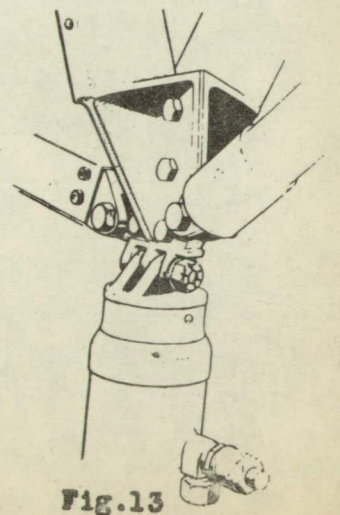


Fig. 13