

PARIS AERO SALON.—View of the Voisin Aeroplane, built on the lines of "Farman No. 1." The machine carries a dummy pilot, and is mounted as if about to fly off into the Grand Nef.

of the real radial type. In the R.E.P. models the engines have either five, seven, or ten cylinders, the last being virtually a double edition of the first. The use of five or seven cylinders simplifies the valve mechanism to a very great extent, as was described in *The Automotor Journal* of November 30th, 1907. Another engine which is "turned up," so that all the cylinders are set radially about the upper half of the base-chamber, is the De Korwin motor, made by Buchet. The Anzani engine has three radial cylinders arranged close together in one plane.

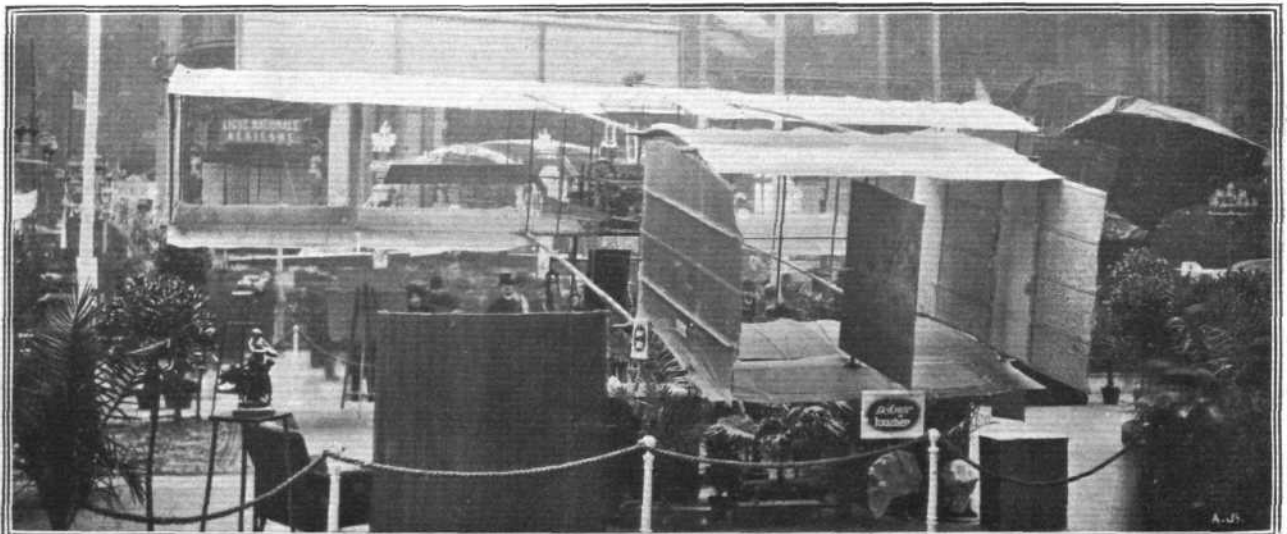
**Forged Steel v. Cast Iron.**

A feature of aeroplane engine construction which was very marked at the Paris Salon, and is the more interesting because it has no parallel in motor car engineering, is the use of steel cylinders forged in one piece with their heads and valve-chambers. Steel cylinders, as our readers know, are used by a few prominent makers of cars, but in such cases they are invariably separate from the cylinder-heads, and are virtually nothing more than a simple tube. In aeronautic engines such as the new Antoinette, the steel cylinder is quite a different thing altogether, for it is, as has been mentioned, forged solid with its own head

and valve-chamber. There is only one valve-chamber properly speaking, in the Antoinette engine, because the induction-valve is of the atmospheric type and is mounted independently under an aluminium cap. When the cylinder is first forged, the valve-chamber which is to be, is, of course, solid, and it has to be bored out in readiness to receive the valves, and a passage has to be made between it and the combustion-chamber in the cylinder. Other engines in which forged steel cylinders are used are the Clement-Bayard, the Gnome, and the Wright engine made by Bariquand and Marre.

**Air v. Water Cooling.**

The two main classifications into which aero motors fall at the present moment are respectively air-cooled and water-cooled types. So far as the exhibits at the Paris Salon go, the representatives of both are fairly equally divided. Among the water-cooled class are the Antoinette, Clement-Bayard, Gobron, Wright, E.N.V., and one of the J.A.P. models, while in the air-cooled category is the other J.A.P., the R.E.P., Anzani, De Korwin (Buchet), Gnome, Farcot, and Renault. In dealing with air-cooled engines, it is necessary to draw attention to those which rely upon natural convection currents to bring fresh air in contact with the hot metal,



PARIS AERO SALON.—Rear view of the Delagrangé Aeroplane, built by Voisin. This illustration shows the box-kite tail and the rudder, which is not visible in the photograph of the Farman machine (above).