

the principal officials to take a gloomy view of its prospects. At any rate, the Government refused to continue its financial assistance to the inventor, and M. Ader had reluctantly to abandon his favourite work.

The histories of many pioneers are sad, especially if they are before their time—and Ader was certainly that. Being a Frenchman, he was born in a sympathetic land, however, but even so, he was very fortunate to get so far as to gain the assistance of the Government at such an early stage in the proceedings. M. Ader himself was an enthusiast on flight from boyhood, and was of course, therefore regarded by many as a mere dreamer. That was in the days before he became sufficiently wealthy as an electrical engineer to put some of his ideas into practice. To modern eyes, his attempts seemed doomed to failure, it is true, but he did his best with the materials at his disposal, and his name unquestionably deserves to go down to history among those of the great. And, although he himself is now perhaps past taking an active interest in modern work, his engineer, M. Espinosa, is actively engaged in the industry.

His Avions.

Ader built three flying machines, and it is the last of these that has been taken from the museum of the Arts et Metiers to grace the first Aeronautical Exhibition; the others no longer exist. His first machine he called "L'Eole," and with that he achieved the flight of 50 metres in 1890; the third machine, on view in the Grand Palais, is the "Avion," with which he demonstrated before the French Government in 1897.

It is a machine of the monoplane type, constructed to resemble a bird in its general shape. Its wings are deeply cambered and arched, and their surface material is stretched over an elaborate framework, presumably intended as a copy of the natural formation of a bird's wing. The wings have a total spread of 16 metres, and present an area of 56 sq. metres; they extend on either side of the body, and are so mounted that they can be swung forwards or backwards slightly in order to shift the centre of pressure relatively to the centre of gravity when desiring to ascend or descend. Beneath the rear portion of the wings, which extend far back in the centre, is a rudder controlled by pedals.

The mechanism, all of which is carried by the main body, consists of a multi-tubular alcohol-fired boiler and two horizontal compound engines. The boiler was rated at 40-h.p., and, when working at 10 atmospheres (140 lbs. per sq. in.), the steam in the dome was usually about 215 degrees C. The engines are placed in front with their cylinders horizontal and their crankshafts longitudinal. Each is coupled direct to the shaft of a tractor screw. They are compound engines with two high-pressure and two low-pressure cylinders each, the dimensions being 65 and 100 mm. bore by 100 mm. stroke. At the normal boiler pressure they developed 20-h.p. each at a speed of 600 r.p.m.; their weight is 21 kilogs. each.

The propellers are most peculiar, for they resemble nothing so much as eight gigantic quill pens arranged in two sets of four. The blades are, in fact, imitation feathers, and are made of bamboo. Each propeller is three metres in diameter, and has a pitch approximating to three metres (it is impossible to give an exact figure with such a form of construction). Their position is such, too, that they overlap one another considerably, and it appears as if that on the port side must have been working under difficulties.

Quite the most interesting fact about the "Avion" is that its entire weight was only 258 kilogs. This is due to the use of nothing but wood in the construction of the framework, and a system of making the joints and employing hollow struts and beams was thought out by M. Ader for the purpose; it is the same as is now put into practice by the Soc. Cons. d'Appareils Aeriens, of which M. Espinosa (M. Ader's engineer) is a Director.

"Ville de Bordeaux."

An airship built by Soc. Surcouf for military work, but if not accepted by the Army, to go to the Soc. Aerieenne, who purpose using it for pleasure-trip service. It is one of the noteworthy series, "La Ville de Paris," "Clement-Bayard," "Col. Renard," and "La Ville de Nancy."

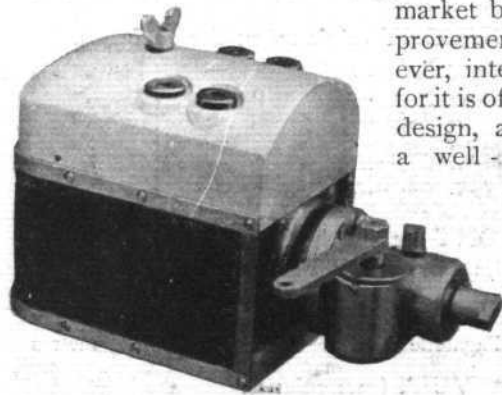
The gas-vessel, which is made of "Continental" fabric, is 53 metres long and 15 metres in diameter; it holds 3,000 cu. m. of gas, and contains an air ballonette which maintains the pressure at 45 mm. water-gauge under all atmospheric conditions. The engine is an 80-h.p. 4-cyl. Renault, and is mounted on four quarter-elliptic leaf-springs placed transversely and shackled to the car. The propeller is 5 m. in diameter, and 3'6 m. in pitch; it runs at 360 r.p.m., being geared down from the main shaft. In front of the car is a triplane elevator having a surface of 16 sq. metres, and behind is a double rudder for steering. Stability against pitching and rolling is provided for by a group of four pear-shaped gas-bags surrounding the rear end of the main envelope.

The car itself was made by Messrs. Esnault-Pelterie, and is mainly of tubular steel work; it is 28 metres long. The envelope is made of "Continental" yellow fabric, and its maximum diameter is well forward; there is, however, not much difference in the diameter along most of the centre part of the envelope. In front it terminates in a short sharp cone, and behind, in a longer cone with a hemispherical end. To serve as an attachment for the car cords, a strip of wood-cored canvas is sewn to the envelope. The cords are lashed to this, and the car is hung from the cords by steel wires.



A NEW BRITISH MAGNETO.

THERE are, comparatively speaking, so few makers of magnetos in this country that the advent of a new British-built machine is a matter of moment. That which has just been placed on the market by the Motor Improvements Co. is, however, interesting in itself, for it is of quite an original design, and is made by a well-known firm of



The Muirhead High-Tension Magneto.

electrical engineers—Messrs. Muirhead. Incidentally, it may be mentioned, the makers' confidence in its reliability has led them to guarantee the material and workmanship for three years. A detailed description of its construction will be included in our series of magneto articles in due course.