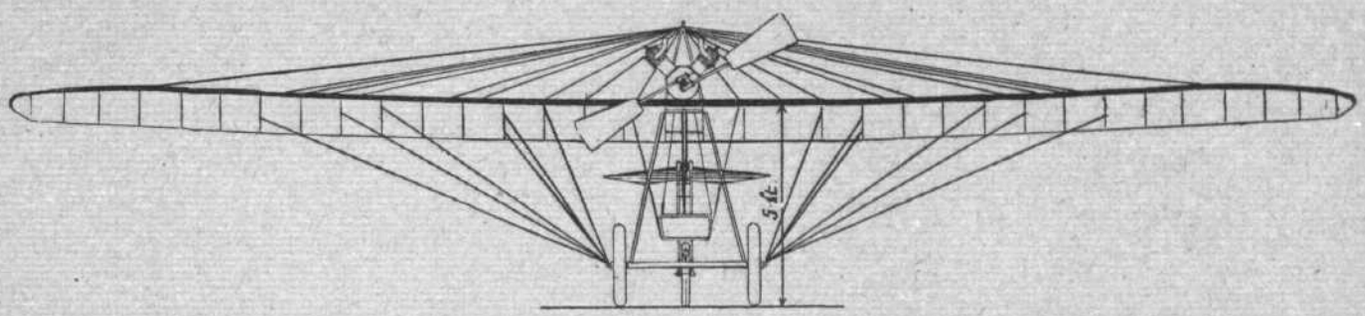
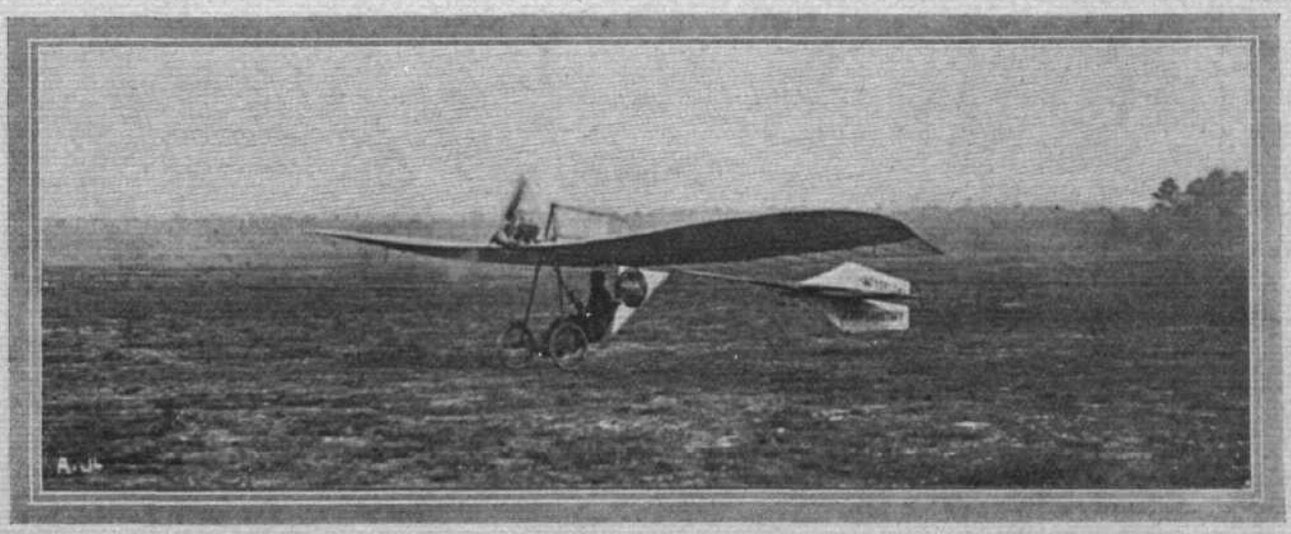
THE GRADE MONOPLANE.

ALTHOUGH in Germany attention has been almost entirely directed to the development of dirigibles, yet the past year has produced one machine with which some very good results have been obtained. It is the invention of Herr Grade, an engineer of Berlin, who has been patiently working away at the problem for some considerable time. His first machine was a triplane, but as a result of his experiments, Herr Grade gradually modified his designs until the successful flyer was evolved in the form of a monoplane, which in silhouette combines several features of the Bleriot and Antoinette machines. Our readers will remember that Herr Grade's first success was obtained during the last few days of last year, when he was able to rise in his machine to an altitude of one metre and cover distances varying between 100 and 400 metres. After that followed a long period of patient experimenting with but little visible result, and it was not until the early part of last September that Herr Grade came prominently into public notice again. He transferred his monoplane to the Mars flying ground, to the south-west of Berlin, and made three short flights, each of a mile and a half in length. Then success followed rapidly, and Herr Grade has gradually improved his record until on November 15th he remained aloft for 54 minutes, during which he occasionally rose as high as 100 metres. One of his most notable performances was the winning of the Lanz prize of £2,000 for the first German-built aeroplane to describe a figure "8" round two posts placed a kilometre apart. This Herr Grade successfully accomplished on October 30th. Although he has had one or two tumbles Herr Grade has only experienced one serious accident, and that was due to the propeller breaking when the machine was flying at a height of 30 metres.

With regard to the machine itself, of which we are enabled to give scale drawings this week, it will be noticed that the planes are mounted on a framework built up of steel tubing and carried on three wheels, which are fitted with pneumatic tyres. This framework is remarkably simple, consisting as it does of the triangular front frame and the tube which forms the backbone of the apparatus. This latter member, as can be seen in the plan, is attached to the front frame by a forked end, and this fork carries the main-planes, and is also continued forward to serve as engine bearers. The main planes are strengthened by wire stays, of which those on the upper side meet at the apex of the vertical front-frame, while those on the under-side are attached to the hub-caps, on the Santos-Dumont method. Our photograph clearly shows the way in which the pilot sits below the main planes in a hammock seat suspended by springs from the framework. He controls the machine by warping the wings, by means of the hand lever, and by the tail, which is similar to that adopted by M. Santos Dumont on his little "Demoiselle." The flyer has an area of 208 square feet, and is fitted with a 4-cyl. air-cooled "V" motor, which is also the production of Herr Grade. This is of 24-h.p. and weighs 35 kilogs. The propeller is a two-bladed metal one, directly attached to the crank-shaft. A keel is fitted above the main plane and is continued behind the pilot's seat. That part of it on top of the machine is of inverted "V" section, as it follows the shape of the top portion of the front frame. Incidentally, therefore, it affords a covering for the pilot.



THE GRADE MONOPLANE.—Front elevation.



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