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VARIABLE PITCH PROPELLERS

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VARIABLE PITCH PROPELLERS

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Translated from
L'Aeronautique, Sept. 30, 1920.
By D. L. Bacon, Assistant Physicist,
Aerodynamical Laboratory, N.A.C.A.
Langley Field, Va.

November, 1920

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TECHNICAL MEMORANDUM. 2

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Translated from L'Aeronautique, September 30, 1920.

Our readers have already seen, from Colonel Dorand's noteworthy article* the importance of the variable pitch propeller. It is only by the use of such a device that a supercharged motor may be used to greatest advantage at all altitudes.

We here describe four different types of propeller which appeared at widely separated dates but which were exhibited together at the last Salon de l'Aeronautique.

The Chauviere Variable Pitch Propeller.

Although this is an old type of variable pitch propeller, the principle of operation is still interesting from a mechanical standpoint.

The propeller blades each carry at the butt end a toothed sector meshing with a bevel gear integrally formed with the spur gear A adjacent to which is a second spur gear B of the same diameter, rigidly attached to the propeller hub. Two internal gears C and D surround these and mesh with them through the intermediary of two trains of planets a, b, c, all rotating freely on their axis. Ring

*L'Aeronautique, No. 2, July, 1919.

Variable Pitch Propeller Used on Italian
Dirigibles.

This propeller has four blades and is built entirely of metal. The inner end of each blade is cylindrical in form and is pivoted in a socket in the hub where it is held by suitable bearings against centrifugal force. Each blade carries a small lug, joined by a link to a central control rod located inside the hollow drive shaft. This rod is splined to the shaft but may slide axially, thus causing the blades to rotate about their own axes. Control is effected through a collar surrounding the shaft, operated by means of a rack and pinion acting against a ball thrust bearing.

The Levasseur Variable Pitch Propeller.

Each blade is built up of wooden laminations in which are securely embedded the ends of eight threaded rods. The butt end, which is cylindrical, fits into a steel cup, the bottom of which is pierced by eight holes through which the ends of the rods project. These are held by nuts on the outside in order to resist centrifugal force. A cap, the internal bore of which is conical, is screwed onto the other end of the cup. This fits a corresponding conical portion of the wooden blade and serves to hold it against vibration and may be used to take up any looseness resulting

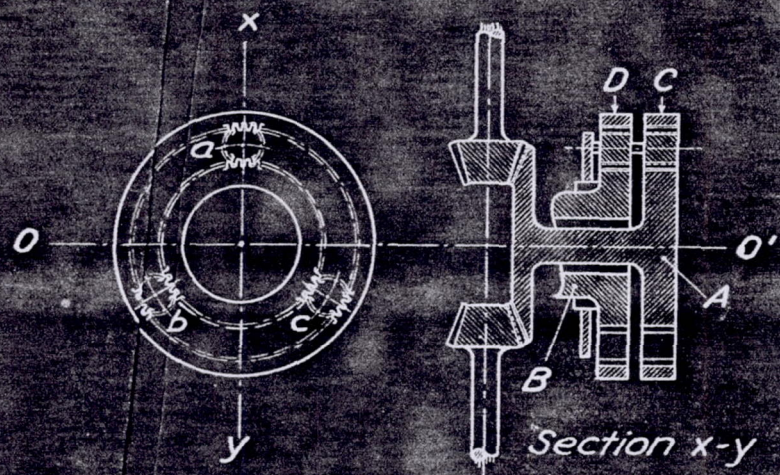


Diagram of CHAUVIÈRE Variable Pitch Propeller (1913)

Diagram of Variable Pitch Propeller used on the CLEMENT-BAYARD DIRIGIBLE

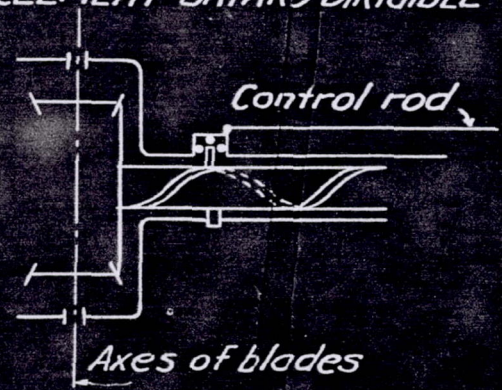


Diagram of Variable Pitch Propeller used on ITALIAN DIRIGIBLES
Control pinion

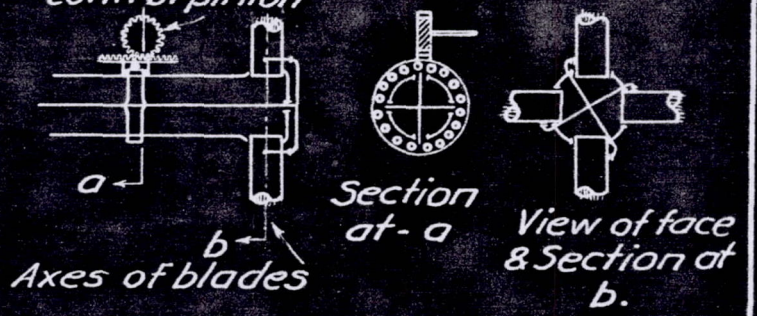


Diagram of the LEVASSEUR Variable Pitch Propeller.

