

PATENT SPECIFICATION



Convention Date (France) : April 3, 1925.

250,207

Application Date (in United Kingdom) : March 17, 1926. No. 7448 / 26.

Complete Accepted : Feb. 3, 1927.

COMPLETE SPECIFICATION.

Improvements in and relating to Turbines.

We, EMILE JEAN CHARLES HENRIOT, of 232, Avenue Rogier, Brussels, Belgium, and EUGENE ALEXANDRE HUGUENARD, of 19, rue du Pont de l'Eure, Paris, France, both of French nationality, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

When it is attempted to obtain very high speeds of rotation with a compressed gas or steam turbine, or any other means, difficulties are encountered by the passage through critical speeds, by the necessity for perfect centering which renders the construction difficult, and by friction which assumes considerable importance as soon as the diameter of the rotating shaft is other than very small.

The present invention allows machines to be constructed in which the rotor, freed of all solid or liquid contact with the stator can find its own axis of rotation and is no longer subjected to friction except the very slight friction with the atmosphere surrounding it. The above mentioned difficulties are avoided and there is no limit to the angular speed except that imposed by the strength of the material forming the rotor.

The invention consists in supporting and driving the rotor solely by a layer of gas, each layer being formed by the union of jets of gas symmetrically disposed about an axis. The gas having a high speed maintains the rotor in a state of stable rotation about a principal axis of inertia entirely out of contact with the stator or any lubricating liquid. As the gaseous jets exert a suction effect on the rotor, a gaseous layer can be used to support the rotor whether it is placed above or below it.

Figures 1 and 2 of the accompanying [Price 1/-]

drawing represent respectively, by way of non-limitative example, the stator and rotor of an air turbine constructed according to this invention.

The stator comprises a body 1 in which is formed a conical recess 2 into which open jets 3 of a suitable form for the flow of gas supplied under pressure through the channel 4. The axes of these jets are disposed along the rectilinear generatrices of a hyperboloid and are directed towards a layer having for its axis the straight line X X which will coincide approximately with the axis of rotation of the rotor lodged in the cavity 2. The rotor is constituted by a body 6 of revolution about an axis $y-y$ having a form suited to the space in which it is to be carried, which body can be striated or furnished with vanes 7 on its lower part, and supports, for example a square prism with optically polished faces to form a rotating mirror 8 as shown in Figure 2.

The rotor, supported on the stator supplied with a compressed gas at suitable pressure, takes up a position of equilibrium without touching the stator. With the jets disposed along the generatrices of a hyperboloid, it is carried in train by the vortex and takes on a rapid movement of rotation.

Figure 3 shows a turbine designed to rotate the member 8; it comprises two associated stators and rotors, the two similar rotors 6, 7, forming a body with the member 8, being fed by the same channel 4. A valve 9 serves to distribute the compressed gas between the two stators, a valve 10 controls the total supply.

Figure 4 shows a modification, with unequal rotors, of the same arrangement. Members of any form can be carried and rotated in this way.

Having now particularly described and

W. G. & C.

ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

- 5 1. A device or machine for obtaining high speeds of rotation in which the rotor is driven and supported solely by a layer of gas formed by the union of jets of gas having a high speed, symmetrically
10 disposed about an axis, the rotor being thus maintained in a state of stable rotation about a principal axis of inertia

entirely out of contact with any solid or liquid.

2. Turbines substantially as described 15 with reference to the accompanying drawings.

Dated this 17th day of March, 1926.

SEFTON-JONES, O'DELL &
STEPHENS,

20

Chartered Patent Agents,
285, High Holborn, London, W.C. 1,
Agents for the Applicants.

[This Drawing is a full-size reproduction of the Original.]

Fig. 1.

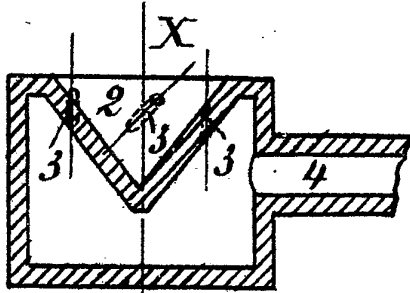


Fig. 2.

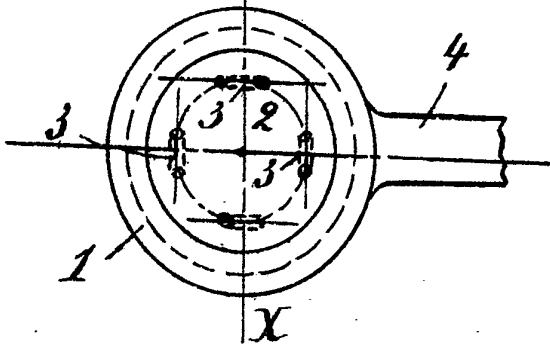
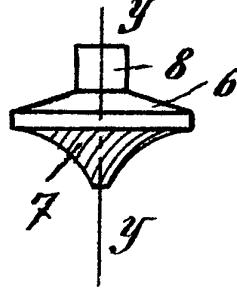


Fig. 4.

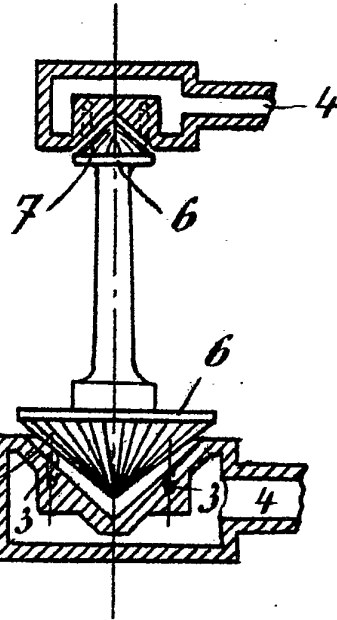


Fig. 3.

