J. H. CORTHÉSY.

TURBINE.

APPLICATION FILED MAY 7, 1910.

981,175.

Patented Jan. 10, 1911.

Fig. 1.

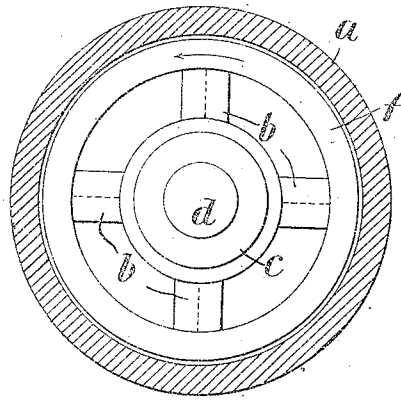


Fig. 2.

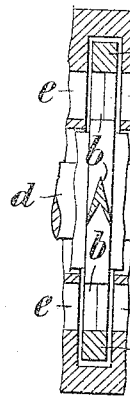


Fig. 3.

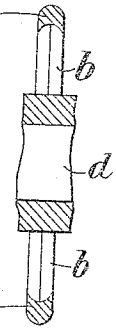


Fig. 4.

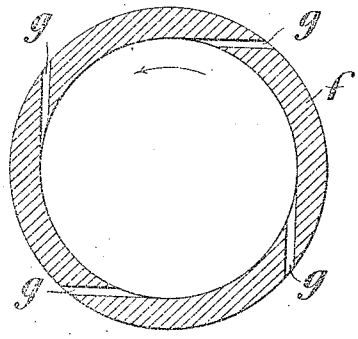


Fig. 5.

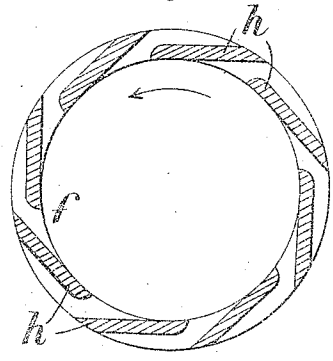


Fig. 6.

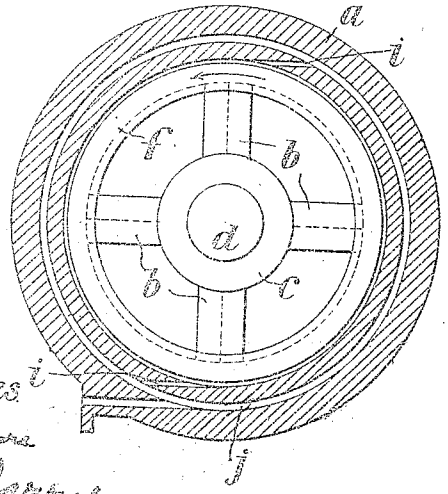
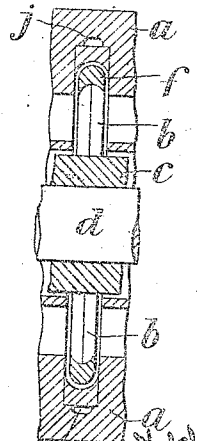


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

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TURBINE.

981,175. Specification of Letters Patent. Patented Jan. 10, 1911.

Application filed May 7, 1910. Serial No. 559,870.

To all whom it may concern:

Be it known that I, JULES HIPPOLYTE CORTHÉSY, a subject of the King of Great Britain, residing at 50 Thornhill Houses, Barnsbury, London, England, have invented new and useful Improvements in Turbines, of which the following is a specification.

This invention relates to turbines, and particularly those in which the actuating fluid travels with the rotor through a large portion of its rotation before being discharged, and has for its object to avoid the loss of kinetic energy of the actuating fluid resulting from its impingement and consequent friction with the curved surface of the casing or chamber inclosing the rotor.

According to the invention a ring or circular shield is attached to the outer extremities of the rotor blades so as to cover more or less of the inner surface of the inclosing casing, the tangential jet, jets or flow of actuating fluid impinging against the moving ring as it rotates with the rotor instead of against the stationary curved surface of the inclosing casing.

The ring or shield may have more or less tangential apertures to allow a certain amount of the actuating fluid to pass through in the direction desired for the purpose of favoring rotation or diminishing the fluid density or pressure in the space between the outer periphery of the said ring and the inner surface of the chamber. The ring may be formed of separate pieces or blades so disposed as to cause the traveling fluid to be redirected at, say, a slight inward angle to the tangent from one such separate piece or blade on to the next one forward, owing to the fluid velocity being greater than that of the rotor, thus avoiding the fluid in a state of velocity or velocity and pressure coming in direct contact with the said stationary surface of the chamber. Small jets may be used on the outer periphery of said ring.

To enable the invention to be fully understood, I will describe the same by reference to the accompanying drawing, in which:—

Figure 1 is a sectional side view of a fluid pressure turbine of the kind hereinbefore described, provided with my improvements. Fig. 2 is a sectional view at right angles to Fig. 1. Fig. 3 is a sectional view illustrating a slight modification. Figs. 4 and 5 are sectional side views illustrating further modifications. Figs. 6 and 7 are views similar to Figs. 1 and 2 respectively illustrating another modification.

a is the outer inclosing casing of the turbine and *b*, *b* are the rotor blades carried by the boss *c* on the shaft *d* and inclosed by the said casing *a*.

e, *e* are the apertures in the casing *a* for the passage of the fluid for actuating the rotor.

f is the ring or circular shield attached to the outer extremities of the blades *b*, *b* by the use of which ring the fluid impinging against the said blades will be prevented from striking the inner curved surface of the casing *a* whereby the consequent loss of energy is avoided.

In Figs. 1 and 2 the ring *f* is shown as being of rectangular form in cross section, while in Fig. 3 it is of a somewhat crescent form.

g, *g* Fig. 4 are the tangential apertures with which the ring *f* may be provided to allow the fluid which has passed between the ring and the casing to be drawn within the ring by suction due to the higher velocity of the fluid passing through and actuating the rotor.

Fig. 5 illustrates the arrangement in which the ring is formed of a series of separate pieces or blades *h*, *h*. These blades *h*, *h* are arranged tangentially as shown and in such relation that a portion of the steam passing through the rotor is redirected from the inner surface of one blade to the inner surface of an adjacent blade and thus in addition to being prevented from coming into direct contact with the curved surface of the chamber *a* assists rotation.

In Figs. 6 and 7, *i*, *i* are tangential apertures formed in the inner curved surface of the casing *a* by which jets of fluid may be directed on to the outer surface of the ring *f* to prevent any condensation of fluid that has passed into the space between the said ring and the casing *a*, and which would tend to retard the movement of the ring, and also to assist in propelling the latter. These jets in the drawing are fed from a common passage *j*, but they may be fed in any other manner. In the said Fig. 6, the ring *f* is shown solid but it may be formed with tangential apertures, as in the arrangement shown in Fig. 4.

Having now particularly described and

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

1. In a fluid pressure turbine having a ring or shield attached to the outer extremities of the rotor blades, tangential openings in the ring attached to the rotor blades, substantially as, and for the purpose set forth.

2. In a fluid pressure turbine having a ring or shield attached to the outer extremities of the rotor blades, the combination with the said ring of a series of separate pieces or blades, substantially as, and for the purpose described.

3. In a fluid pressure turbine having a ring or shield attached to the outer extremities of the rotor blades, apertures in the outer casing whereby jets of fluid are directed on to the outer periphery of the ring surrounding the rotor blades, substantially as and for the purpose set forth.

4. In a fluid pressure turbine, the combination with a casing provided with axial passages for the pressure fluid, of a rotor within said casing provided with blades in line with said axial passages, a ring surrounding said blades and provided with passages extending from the inner face of said ring to the outer face thereof and communicating with the space between the rotor and the casing.

5. In a fluid pressure turbine, the combination with a casing provided with axial passages for the pressure fluid, of a rotor within said casing provided with blades in line with said axial passages, a ring surrounding said blades and provided with passages extending from the inner face of said ring to the outer face thereof and communicating with the space between the rotor and the casing, the portions of said ring, between said passages therein, having substantially tangential faces for directing the fluid from one face to another.

6. In a fluid pressure turbine, the combination with a casing provided with axial passages for the pressure fluid, of a rotor within said casing provided with blades in line with said axial passages, a ring surrounding said blades and provided with a plurality of separated tangentially disposed blades, having tangentially disposed passages between them leading from the inner face to the outer face of said ring.

7. In a fluid pressure turbine, the combination with the casing, provided with axial passages for the pressure fluid, of a rotor provided with blades in line with said passages, a ring surrounding said blades and connected with the rotor, said casing being provided with tangentially disposed passages communicating with the space between the outer periphery of said ring and said rotor, and means for supplying fluid under pressure to said tangential passages in the casing.

8. In a fluid pressure turbine, the combination with the casing, provided with axial passages for the pressure fluid, of a rotor provided with blades in line with said passages, a ring surrounding said blades and connected with the rotor, said casing being provided with tangentially disposed passages communicating with the space between the outer periphery of said ring and said rotor, and a common passage communicating with said tangential passages, and means for supplying fluid under pressure to said common passage.

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