A. RECTOR.

TURBINE.

APPLICATION FILED FEB. 25, 1914.

1,127,678.

Patented Feb. 9, 1915.

Fig. 2.

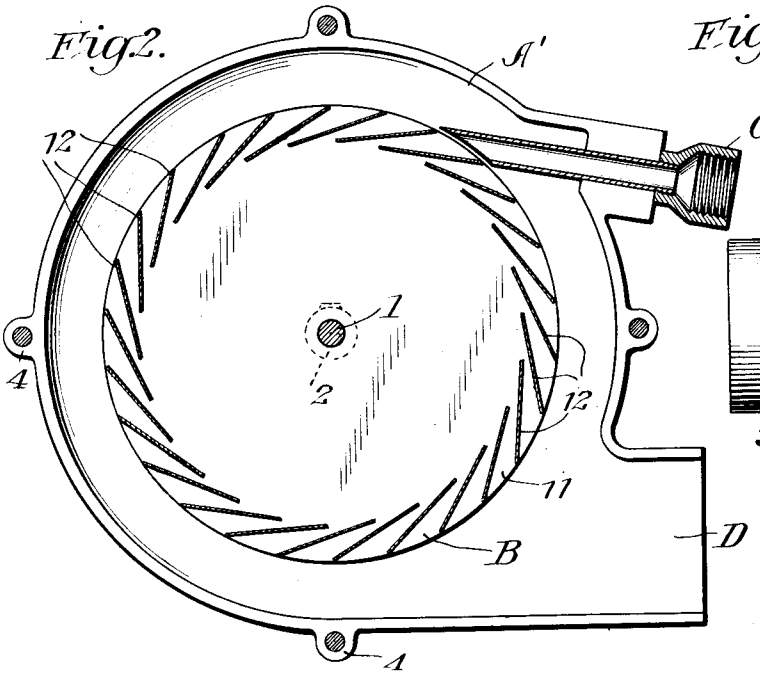


Fig. 1.

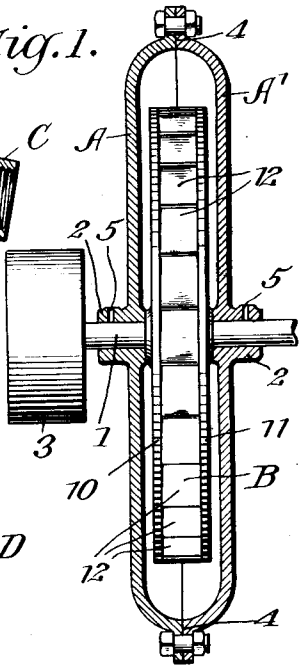


Fig. 3.

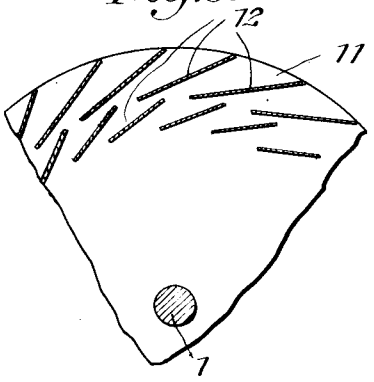
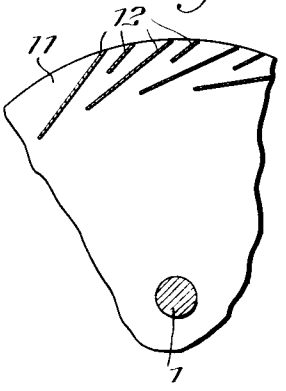


Fig. 4.



WITNESSES

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TURBINE.

1,127,678. Specification of Letters Patent. Patented Feb. 9, 1915.

Application filed February 25, 1914. Serial No. 820,819.

To all whom it may concern:

Be it known that I, ALCORN RECTOR, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Turbines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as to enable any one skilled in the art to make and use the same, reference being had to the accompanying description and drawing, which form a part of the specification.

One object of my invention is to construct a turbine with the vanes so arranged that each vane will receive a direct impact of the steam or other propelling fluid so that each and every vane will be positively operated upon by the steam just so long as the speed of the periphery of the turbine wheel is less than the speed of the projected steam. When the speed of the travel of the steam becomes less than the peripheral speed of the turbine wheel, then the steam will exhaust through the blades and out of the confined space in which it has done its work. When the speed of the periphery of the wheel is less than the speed of the steam travel, the steam becomes compressed in the confined space of the wheel, the exhaust being effected between the vanes and out of the wheel in an opposite direction to the travel of the wheel, the working steam being still confined within the walls of the wheel.

Other objects will appear from the subjoined specification and claims.

In order that my invention may be more easily understood, the same is illustrated with reference to the accompanying drawing, of which;

Figure 1 is an end elevation of my turbine wheel shown mounted in its casing, the casing being in section. Fig. 2 is a side elevation of the turbine wheel and one-half of the casing surrounding the same, the inlet nozzle being in section. Figs. 3 and 4 are detailed views of modified construction of wheels showing various arrangements of operating blades, all of which are within the scope of my generic invention.

Referring to the drawings in which the same reference numerals refer to corresponding parts throughout the same, A, A′ represent the casing, B the turbine wheel, C the inlet nozzle and D the exhaust.

1 is a shaft mounted in suitable bearings 2 in the casing and upon the shaft is fixedly mounted the turbine wheel B. Upon the end of the shaft is a fixed pulley 3 which is used to convey power from the turbine to the machinery which is to be operated thereby. Two parts of the casing A, A′ are secured together at 4, by bolts or otherwise.

5 indicates suitable lubricating openings.

The turbine wheel is composed of two plates, 10 and 11 secured to each of which are the blades 12. These blades are so situated with respect to one another that steam which is projected through the inlet nozzle will in part operate directly against the under side of the blade nearest the nozzle, and in part will pass by the end of the blade and operate by impact against the end and under side of the next succeeding blade and so on. The steam will impact against each blade in succession until the speed of the steam equals or is less than the speed of the wheel, when the steam will exhaust between the blades and pass out of the engine. The exhaust will take place only after the steam has performed its work, and it has no power or energy for further work.

In Fig. 3, I have shown a system of blades arranged at different angles with respect to each other and in two concentric circles. The inner circle of blades constitute what I term "baffling blades" and it is against the inner ends of each of these blades that the steam is caused to operate in succession by impact in the same manner as above described with respect to the system of blades shown in Fig. 2.

In Fig. 4, I have shown a system of blades in which long blades alternate with shorter ones and the ends and sides of the series of shorter blades are only operated upon by impact of the steam, when the steam enters and exhausts.

The principle upon which my device operates is to take advantage of the impact of the steam upon each blade which is not traveling at as great a speed as the steam, and as soon as the steam reaches a point in its travel in which it can do no further work, it then exhausts. By reason of the special construction of blades shown in Fig. 2, the steam will impact upon each successive blade.

In Fig. 3 direct impact of the steam takes place against the ends and under sides of the blades which are arranged at the periph-

ery wheel and through which or between which the steam or operating fluid passes, and in turn operates in a similar manner against the baffle blades.

While my construction of turbine is specially adapted for operation by means of steam, it may be operated by other gases and fluids, by water and by air.

In the operation of my turbine, the steam enters the wheel between its vanes or blades and remains in the wheel after the fashion of a whirlwind, and while whirling it comes directly in contact with the inner walls of the wheel and the under sides and ends of its vanes or blades, and exhausts between its vanes or blades in the opposite direction to which it entered.

Having described my invention, what I claim as new and desire to obtain by Letters Patent is:

1. In a turbine, in combination with an inlet nozzle of an operating wheel having blades so situated with respect to each other and with respect to the said nozzle that operating steam will enter into the center of the wheel between two contiguous blades and will upon entrance therein impact upon a blade and after entrance will in part pass by the end of that blade and impact against the next succeeding blade and continue the operation successively and progressively against the next succeeding blades until its operative force is spent.

2. In a turbine, an inlet nozzle in combination with a wheel closed at its sides and having a series of blades arranged around its periphery between the sides thereof, means for projecting the steam from the nozzle into the center of the wheel through contiguous blades and for exerting the pressure thereof directly, successively and progressively upon the inner ends and faces of the blades and means for exhausting the steam through the blades when incapable of further impact thereupon.

3. In a turbine in combination with a nozzle, of a wheel provided with inclosing sides and with blades or vanes secured thereto and so arranged with respect to one another that the fluid projected through the blades into the center of the wheel will while within the wheel impact directly, continuously and progressively against the sides of the wheel and also directly, continuously, successively and progressively against the inner edges and faces of the vanes until its operative force is spent.

4. In a turbine, a wheel, means for causing the steam to enter the wheel through its periphery between its vanes or blades, means for causing the steam to remain in the wheel and assume a motion after the fashion of a whirlwind and while whirling to flow within the wheel at a much greater velocity than the speed of the periphery of the wheel and means for causing portions of the steam to impact progressively and successively against the blades of the wheel and to then exhaust when its operative force is spent.

5. In a turbine, a wheel provided with vanes or blades, means for passing the steam into the center of the wheel between its vanes or blades, means for confining the steam in the wheel and while so confined to cause it to flow after the fashion of a whirlwind and while so flowing to in part progressively impact upon the vanes and inner walls thereof and means for exhausting that portion of steam between the vanes and blades when the peripheral speed of the wheel is greater than the speed of the steam.

6. In a turbine, a wheel provided with a series of vanes or blades, means for passing the steam into the wheel between its vanes or blades, means for causing the steam to move within the wheel in whirlwind fashion, means for causing the steam to progressively operate while within the wheel upon the vanes or blades and means to cause the steam to exhaust when the speed of the steam becomes less than the peripheral speed of the wheel.

7. In a turbine, a wheel provided with a series of vanes or blades, means for passing the steam into the wheel between its vanes or blades, means for causing the steam to move within the wheel in whirlwind fashion, means for causing the steam to progressively operate while within the wheel upon the vanes or blades and means to cause the steam to exhaust from the wheel between its vanes or blades.

In witness whereof I have hereunto set my hand at the borough of Manhattan, city and State of New York, this 21st day of February, 1914.

ALCORN RECTOR

In presence of—
JOHN J. RANAGAN,
AGNES C. O'CONNELL.