No. 856,204. PATENTED JUNE 11, 1907.

C. A. BACKSTROM.

TURBINE NOZZLE VALVE.

APPLICATION FILED APR. 1, 1904. RENEWED APR. 22, 1907.

Fig. 2.

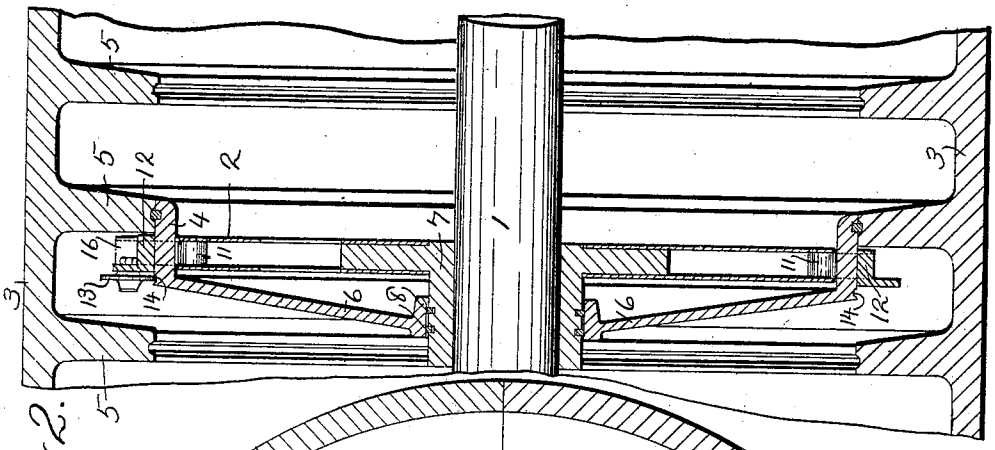
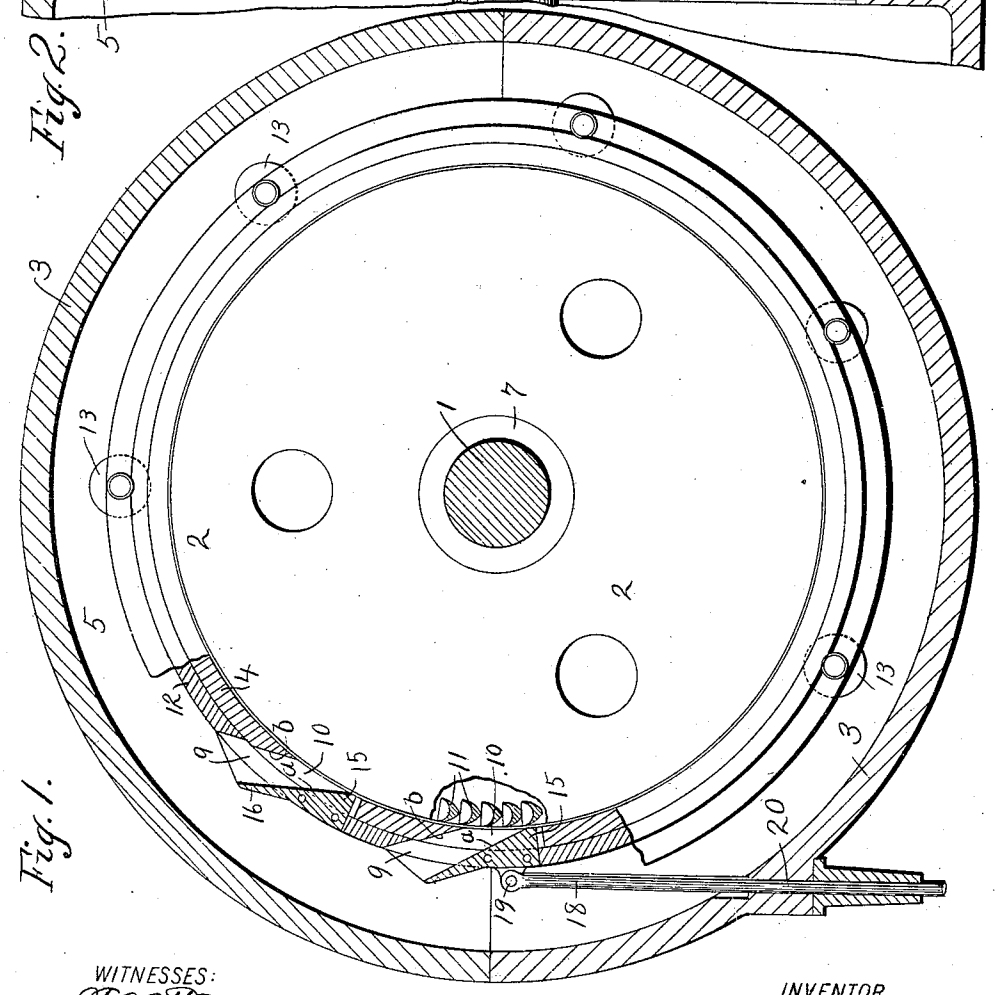


Fig. 1.



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TURBINE NOZZLE-VALVE.

No. 856,204. Specification of Letters Patent. Patented June 11, 1907.

Application filed April 1, 1904. Renewed April 22, 1907. Serial No. 369,572.

To all whom it may concern:

Be it known that I, CHARLES A. BACKSTROM, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Turbine Nozzle-Valves, of which the following is a specification.

My invention relates to improvements in turbine nozzle valves.

The object of my invention is to provide means, whereby the nozzle apertures may be varied in size without change of form and without material frictional resistance.

In the following description reference is had to the accompanying drawings in which,—

Figure 1 is a transverse sectional view of a turbine showing a nozzle partition with portions thereof together with the valve ring and running wheel partially broken away to show the valves and the relation thereof to the vanes of the running wheel. Fig. 2 is a detail view in longitudinal section showing a nozzle partition, valve ring and running wheel.

Like parts are identified by the same reference characters in both views.

1 is the turbine shaft; 2 a running wheel and 3 the outer casing.

4 is a nozzle ring forming part of a partition, one member 5 of which extends outwardly to the casing 3 and the other member 6 of which extends inwardly to the hub 7 of the running wheel with suitable bearing rings 8 interposed between the partition and hub. The nozzle ring 4 encircles the running wheel 2 and is provided with nozzle apertures 10 for the delivery of motive fluid to the vanes 11 of the running wheel. A valve ring 12 encircles the nozzle ring and is provided with rollers 13 traveling in a groove at 14 in the nozzle ring, whereby the valve ring is supported. The valve ring is provided with apertures 9 adapted to register with the nozzle apertures 10 and projections 15 extending into each nozzle aperture 10 and having one diagonal wall *a* adapted to form one of the walls of the nozzle. The nozzle ring is also provided with outwardly extending projections 16, the inner face of which is continuous with the face *a*. A valve actuating rod 18 is pivoted to the valve ring at 19 and extends outwardly through the turbine casing 3 at 20. Any ordinary mechanism may be employed for actuating the rod 18, the movement of which is preferably controlled by a governor. The governing mechanism, however, forms no part of the present invention, and is therefore not illustrated.

It will be observed that as the valve ring is oscillated the face *a* of the projections 15 and 16 is brought into greater or less proximity with the face *b* of the nozzle aperture 10 in the ring 4 and the amount of motive fluid delivered to the vanes 11 may therefore be increased or diminished without altering the form of the nozzle.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is,—

1. In a turbine, the combination of a nozzle ring provided with nozzle apertures; of a valve ring encircling the nozzle ring and provided with apertures adapted to register with the nozzle apertures; and projections extending inwardly from the valve ring into each nozzle aperture and constituting one wall of the nozzle; together with a set of rollers mounted on the valve ring and arranged to support the valve ring from the nozzle ring.

2. In a turbine, the combination of a nozzle ring provided with nozzle apertures; a valve ring having apertures adapted to register with those of the nozzle ring and provided with inwardly and outwardly extending projections at one side of such apertures, each such aperture having a diagonal face adapted to form one wall of the nozzle.

3. In a turbine, the combination of a nozzle ring provided with nozzle apertures; a valve controlling delivery of fluid through the nozzle apertures; and rollers connected with the valve and supporting the latter from the nozzle ring.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES A. BACKSTROM.

Witnesses:
JAS. B. ERWIN,
LEVERETT C. WHEELER.