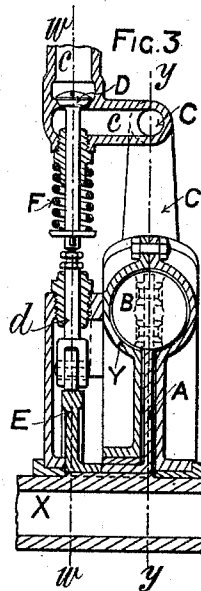
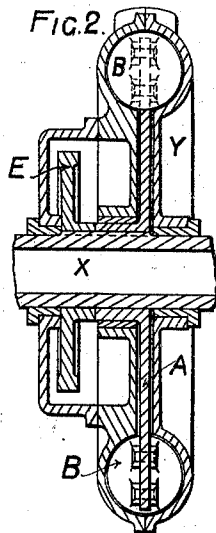
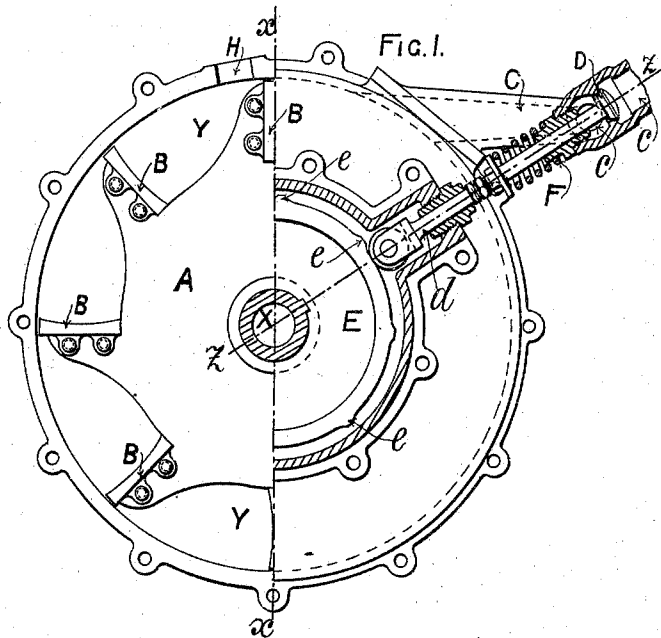


A. A. HOLLE.
STEAM TURBINE.
APPLICATION FILED DEC. 4, 1909.

967,639.

Patented Aug. 16, 1910.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALEXANDER ALBERT HOLLE, OF OLST, NETHERLANDS.

STEAM-TURBINE.

967,639.

Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed December 4, 1909. Serial No. 531,413.

To all whom it may concern:

Be it known that I, ALEXANDER ALBERT HOLLE, a subject of the Queen of the Netherlands, residing at Haere House, Olst, Holland, in the Kingdom of the Netherlands, have invented a new and useful Improvement in Steam and other Fluid Turbines, of which the following is a full and complete specification.

This invention relates to steam and other fluid turbines of the impact type, and has for its objects increasing the efficiency and economy of this type of prime mover. I attain this end by providing for the intermittent and momentary admission of steam or other fluid to the chamber containing the vanes and for the exhaustion of the steam or other fluid from said chamber immediately the admission has ceased, so that the volume of steam or other fluid acts on the vanes solely by impact or impulse and not by either pressure or expansion. In other words, motion is imparted to the vanes by a series of blows and not by a series of pushes as has hitherto been the practice.

In the accompanying drawing which illustrates in a diagrammatic manner one method of carrying this invention into effect: Figure 1 is a view in transverse section, one half being a section on line *v v* and the other half a section on line *w w* Fig. 3. Fig. 2 is a broken view in section on line *x x* Fig. 1, and Fig. 3 is a broken view in section on line *z z*.

Throughout the views similar parts are marked with like letters of reference.

The disks A—of which there may be any number—are mounted on a shaft X running in suitable bearings and each carries a predetermined number of vanes B which are arranged at a predetermined distance from one another, the vanes being inclosed in a suitable chamber Y. The nozzle C for the admission of the steam or other fluid into the chamber Y is arranged tangentially or approximately so to the circumferential center line of the vanes, and in the inlet pipe or passage *c* leading to the said nozzle is an admission valve D which is mechanically operated to open it by a series of cams *e* mounted or formed on a disk E fixed on the shaft X and operating through lifters *d* said

cams being so shaped and set in relation to the vanes B that the admission valve is only opened momentarily when each of the vanes comes into a radial position approximately at right angles to the center of the nozzle C and is closed by the action of a spring such as F.

In the chamber Y is an exhaust port H which is so located that the vanes open said port to the side on which the steam or other fluid is admitted immediately after the admission valve is closed.

To assist in clearing the space between the vanes of the exhaust steam a slight vacuum or negative pressure may be maintained at said exhaust port which may be effected by any suitable apparatus such for instance as a condenser.

Turbines of large power may consist of any number of units as hereinbefore described, or the power of each said unit may be increased by the employment of more than one nozzle to each chamber. The preferred construction in such latter arrangement would be to so arrange the nozzles and the admission valves that the vanes receive their impulses in succession and not simultaneously. Where a number of nozzles are employed the admission valves may be operated from a countershaft driven at a suitable speed from the main shaft of the turbine and the cams be shaped and arranged accordingly.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a turbine-engine, the combination, with an annular cylinder provided with a tangentially-arranged inlet-nozzle, of a rotary disk provided with a piston-vane which works in the said cylinder, an inlet-valve controlling the said nozzle, and trip-mechanism operated from the said disk and adapted to open the said valve for a relatively very short interval each time the said piston-vane comes opposite the said nozzle.

2. In a turbine-engine, the combination, with an annular cylinder provided with a tangentially-arranged inlet-nozzle, of a rotary disk provided with a piston-vane which works in the said cylinder, an inlet-valve controlling the said nozzle and provided

with a stem, a cam which revolves with the
said disk and which operates the said stem
to open the valve for a relatively very short
interval each time the said piston-vane
5 comes opposite the said nozzle, and means
for closing the said valve automatically
when released by the said cam.

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

ALEXANDER ALBERT HOLLE.

Witnesses:

ROBERT F. PHILLIPS,
G. V. SYMES.