No. 823,641. PATENTED JUNE 19, 1906.

A. I. SENIOR.

STEAM TURBINE.

APPLICATION FILED APR. 4, 1905.

Fig. 5.

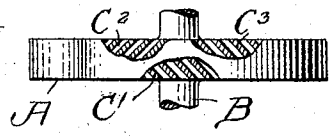


Fig. 4.

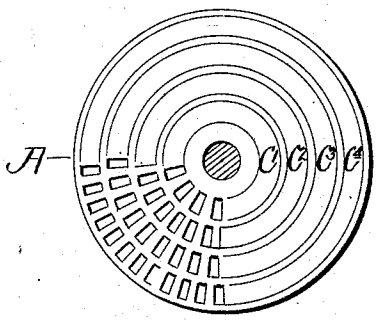


Fig. 3.

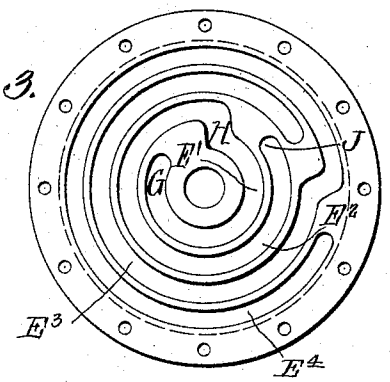


Fig. 1.

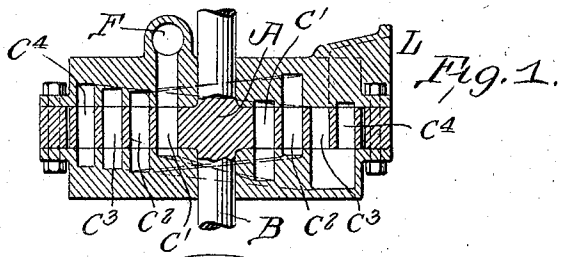
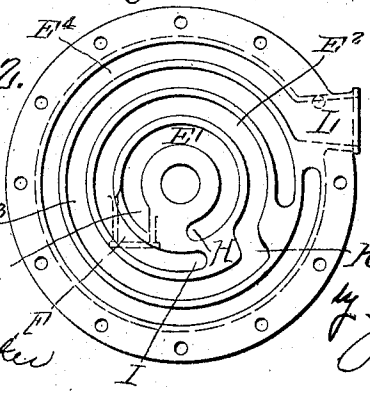


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

ALFRED IRVINE SENIOR, OF MOTUEKA, NEW ZEALAND.

STEAM-TURBINE.

No. 823,641. Specification of Letters Patent. Patented June 19, 1906.

Application filed April 4, 1905. Serial No. 253,758.

To all whom it may concern:

Be it known that I, ALFRED IRVINE SENIOR, a subject of His Majesty King Edward of England, residing at Motueka, Nelson District, New Zealand, have invented a new and useful Steam-Turbine, of which the following is a specification.

My invention relates to improvements in steam-turbines in which a cylindrical disk, a piston is secured to or made in common with the shaft, causing the same to transmit power in an economical manner. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a transverse section of the entire machine. Figs. 2 and 3 are plans looking at the inside of the covers as they would appear when removed from the machine. Fig. 4 is a plan of the central revolving disk which contains the operating-vanes. Fig. 5 is a view, partly in section, of the central revolving disk, showing angle of the vanes.

Similar letters refer to similar parts throughout the several views.

The central revolving disk A, which is secured to or made in one piece with the shaft B and revolves with same, has any number of circular rows of vanes C' C^2 C^3 C^4 cast, machined out, or punched out of it, the angle of these vanes being reversed in each alternate row from the center outward. This disk A revolves between the two covers D' and D^2. These covers have circular annular grooves or channels E' E^2 E^3 E^4 running round their center and at such a distance from their center as to bring one groove in each cover opposite the corresponding vanes C' C^2 C^3 C^4 in the central disk A. These grooves or channels E' E^2 E^3 E^4 are not of one depth in the covers D' and D^2, Figs. 2 and 3, but run from full depth to nothing and from nothing to full depth in each alternate groove, as in the present plan. Groove E' in one of the covers is in communication with steam-inlet F at G, at which point it is at its full depth in Fig. 2, and the corresponding groove in the opposite cover is at its least depth at G, as shown in Figs. 1 and 3, said groove gradually getting deeper as it goes round the center till it gets to H in Fig. 3 and gradually getting shallower as it goes round its center till it gets to H in Fig. 2.

At H in Fig. 3 groove E' being at its deepest point passes through its retaining-wall into groove E^2, thereby making groove E^2 also deepest at H in Fig. 3 and shallowest at I, Fig. 2. From this point H in Fig. 3 groove E^2 gets shallower till it runs out to nothing at J, and in Fig. 2 groove E^2 gets deeper till it reaches K, where being at its deepest it passes through its retaining-wall into groove E^3. This process is continued on in the same manner in each alternate groove till the channels or grooves run out into the exhaust at L in Fig. 2. By making these channels run alternately from depth to nothing, and vice versa, the steam or other motive agency used is wedged backward and forward through each alternate row of vanes in the central disk A in its passage from inlet F to outlet L, thereby causing central disk to revolve. The motion of this disk A can be reversed by admitting steam or other motive agency at L, and thus causing it to issue at F.

I am aware that prior to my invention turbines have been made with angular vanes or a wheel or series of wheels, against which the steam is driven. I therefore do not claim such a combination broadly; but

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

1. In a turbine, the combination of a rotative disk or piston provided with a plurality of concentric series of apertures each having an inclined radially-disposed wall constituting a vane or bucket, the walls in each series being oppositely inclined from those in the next adjacent series, and end plates arranged in facial contact with the side faces of the disk, said plates having circular concentric channels, the bottom walls of which are of gradually-increasing depth from one end of said channels to the other, said channels registering with the series of apertures in the piston, and the deep portion of the channel in one plate registering with the shallow portion of the corresponding channel in the other plate.

2. In a turbine, the combination of a rotative disk or piston provided with a plurality of concentric series of apertures, each having an inclined radially-disposed wall constituting a vane or bucket, the walls in each series being oppositely inclined from those in the next adjacent series, and end plates having annular concentric channels, the bottom walls of which are of gradually-increasing depth from one end of the channels to the other, the bottom wall of each being inclined oppositely to the bottom of the next adjacent channels, said plates being so arranged

that said channels register with the series of apertures in the rotative disk, and the deep portion of each channel in one plate in register with the shallow portion of the corresponding groove in the other plate.

3. In a turbine, the combination of a rotative disk or piston provided with a plurality of concentric series of apertures, each having an inclined radially-disposed wall constituting a vane or bucket, the walls in each series being oppositely inclined from those in the next adjacent series, and end plates having annular concentric channels, the bottom walls of which are of gradually-increasing depth from one end of the channels to the other, the bottom wall of each channel being inclined oppositely to the bottoms of the next adjacent channels, the channels in each plate communicating with each other at their deepest point, said plates being so arranged that said channels register with the series of apertures in the rotative disk, and the deep portion of each channel in one plate registers with the shallow portion of the corresponding groove in the other plate.

4. In a turbine, the combination of a rotative disk or piston provided with a plurality of concentric series of vanes, and end plates arranged in facial contact with the side faces of said piston, said plates having circular concentric channels varying in depth from one end to the other, said plates being arranged with the channels registering with the series of vanes, the deep portion of each channel in one plate registering with the shallow portion of the corresponding channel in the other plate.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

ALFRED IRVINE SENIOR.

Witnesses:

ROBERT LOGAN, Senr.,

LEONARD B. HARRIS.