W. ANDERSON.

TURBINE.

APPLICATION FILED MAR. 12, 1912.

1,041,562. Patented Oct. 15, 1912.

Fig. 1.

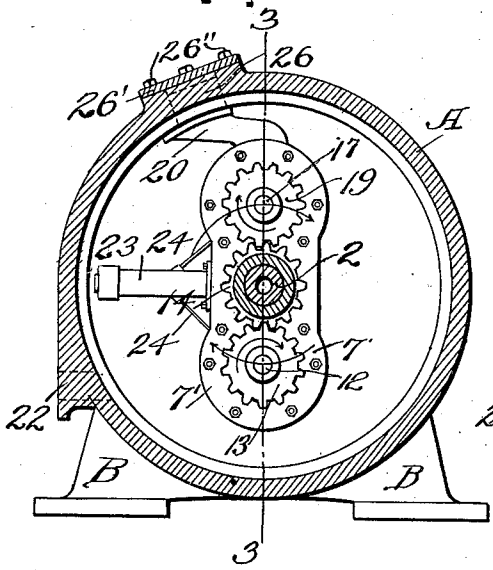


Fig. 2.

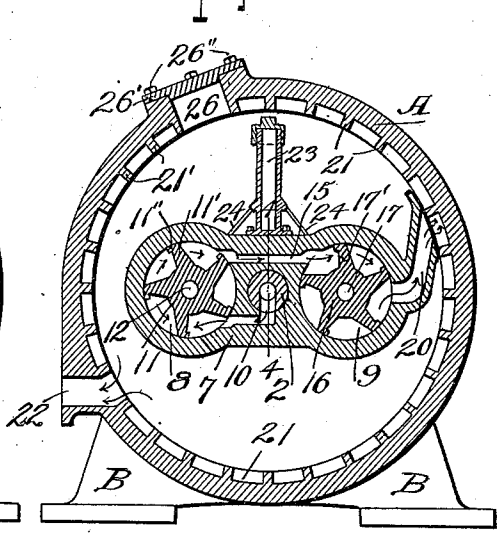


Fig. 3.

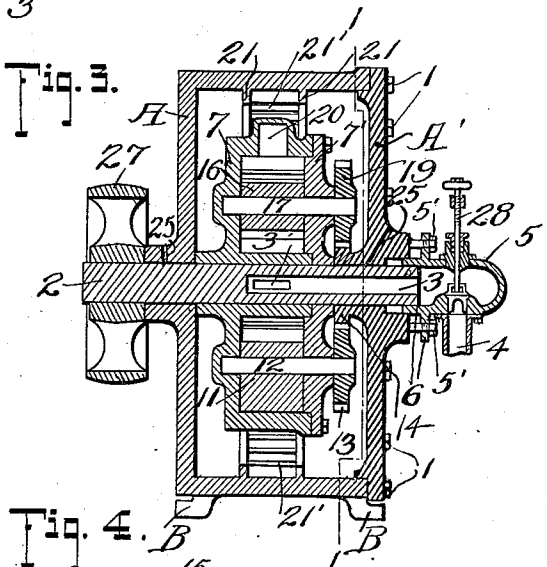
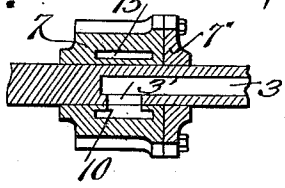


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TURBINE.

1,041,562. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed March 12, 1912. Serial No. 683,327.

To all whom it may concern:

Be it known that I, WILLIAM ANDERSON, a citizen of Norway, residing at Parkland, in the county of Pierce and State of Washington, United States of America, have invented certain new and useful Improvements in Turbine-Engines, of which the following is a specification.

This invention relates to improvements in turbine engines, its primary object being to provide a simple and compact engine capable of developing the maximum amount of power in proportion to the amount of pressure medium utilized.

Specifically, the engine herein described is constructed for use of steam as the pressure medium, and it is contemplated to use the steam thrice in producing the power before it is finally exhausted, the parts of the driving mechanism so coöperating as to afford much power and use a small amount of steam.

While I have illustrated the preferred construction for using steam as the pressure medium, it will be evident that other mediums may be utilized with equally good results.

For a full understanding of the present invention, reference is to be had to the following description and the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view showing the driving elements in elevation, said section being taken approximately on the line 1—1 of Fig. 3; Fig. 2 is a similar sectional view on the line 2—2 of Fig. 3; Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1; and Fig. 4 is a transverse sectional view on an enlarged scale through the revolving member, taken about on the line 4—4 of Fig. 2.

Throughout the following detail description and on the several figures of the drawings, similar parts are referred to by like reference characters.

Referring to the drawings and specifically describing my invention, an engine constructed in accordance therewith comprises an outer casing or housing A supported on suitable standards B constituting a base, one of the sides of the casing, designated as A′, being removably secured thereto by means of suitable fastenings or bolts 1, the construction thus described permitting access to the interior of the casing.

Mounted transversely of the casing A and having its bearings centrally of the sides thereof is a drive shaft 2, formed with a longitudinal supply conduit 3 extending from one end of said shaft to approximately its center within the casing. The conduit 3 communicates with the pressure supply pipe 4 which is connected to the valve 5 secured to the removable side A′ by means of bolts 5′, said valve being suitably formed with flanges 6 between which the usual packing is provided.

Mounted within the casing A fixedly on the shaft 2, is an elongated revoluble shell or member 7 comprising chambers 8 and 9 located at its respective end portions. Access to this shell is accomplished by the removal of the side 7′ which is adjacent to the removable side A′ of the casing A.

As hereinbefore premised, the pressure medium used in connection with the construction of engine to be described is steam, said steam passing from the supply conduit 3 through an opening 3′ into the passage 10 in the shell 7, communicating with the chamber 8 in which is mounted an impulse wheel 11 secured on the countershaft 12, the latter having its bearings in the sides of the shell. The wheel 11 comprises a plurality of radial blades 11′, the outer extremities of which are projected tangentially with respect to the rotation of the wheel, as indicated at 11″, and the ends of the blades thus formed are slightly narrower than the passage 10 which is enlarged where it communicates with the chamber 8. The steam under pressure impinges against the blades 11′ causing the wheel 11 to revolve, and through the medium of the pinion 13 secured to the shaft 12 at its outer extremity projecting through the revoluble member 7, which pinion meshes with a gear 14 fixed to the removable side A′ of the casing A, motion is transmitted to the shell, causing the same to revolve in the same direction to the movement of the wheel 11. Only a small amount of the power of the steam has been utilized up to this point and it now passes from the chamber 8 through the passage 15 into the chamber 9 at the other end of the shell 7. In this chamber a similar reaction wheel 16 is mounted on the countershaft 17, and said wheel is provided with radial blades 17′ of similar construction to the blades 11′. A pinion 19 is secured to the end

of the countershaft 17 outside of the revoluble member 7 and meshes with the gear 14 on its opposite side from the pinion 13, thereby assisting in an evident manner the revolution of the shell 7 by the said corresponding pinion 13. The steam now issues tangentially relative to the axis of the rotation of the member 7, from the chamber 9 through the nozzle 20 projecting from the end of the member 7, the impact thereof being directed against the abutments or projections 21′ formed on the inner periphery of the casing A. Said peripheral abutments are arranged transversely of the flanges 21 integral with the casing, a plurality of pockets being formed thereby. The tendency of this last mentioned impact of the steam is to supplement or aid in the revolution of the member 7 and the spent steam exhausts through the outlet 22 in the lower portion of the casing A.

An important feature in the construction of my device is the mounting of the impulse wheels at opposite sides of the axis of the revoluble member, thereby producing a balancing effect which insures a smooth running action of the rotation of the revoluble member, and which is necessary in a device of this nature.

As will be most clearly seen in Fig. 2 of the drawings, the ends of the passage 15 are enlarged in a similar manner to the outlet of the passage 10, the purpose of the enlargements being to prevent the closure of said passages by the projections 11″ of the blades 11′, and those on the wheel 16.

Any desired lubricating means may be employed in connection with the mechanism herein described and I have therefore shown conventionally a lubricant reservoir 23 secured at one side of the shell 7 and provided with feeding conduits 24 extending into said shell. At a suitable point in the casing A may also be provided lubricant feeding passages 25 whereby the oil may be supplied to the bearings of the shaft 2. At a suitable point in the casing A an opening 26 is provided through which the lubricant may be supplied to the reservoir 23 when needed. The covering 26′ is fastened in place over the opening 26 by means of the bolts 26″.

The outer extremity of the shaft 2 at one side of the casing is suitably provided with a pulley 27 from which power may be taken.

It will be obvious from the foregoing description that the steam or pressure medium as controlled by the throttle 28 passes through the shell 7 and by means of the impulse wheels contained in the steam chambers at its opposite extremity the said shell twice utilizes the power possessed by the pressure medium and a further utilization of the power is afforded by the direction of said pressure medium against the peripheral abutments on the casing. In this manner a maximum amount of power is obtained from a small supply of pressure medium.

Any number of revoluble members may be provided on the drive shaft to increase the power desired and it will be understood that numerous other changes may be made in the details of construction without departing from the spirit of my invention and within the scope of the claims hereto appended.

Having thus described the invention, what is claimed as new is:

1. A turbine engine comprising a supply conduit for a pressure medium, a revoluble member, impulse wheels mounted in said member at opposite sides of its axis, and means operable by the impulse wheels for causing rotation of the revoluble member.

2. A turbine engine comprising a supply conduit for a pressure medium, a revoluble member, an impulse wheel mounted in said member at one end and adapted to receive impact of the pressure medium, a second impulse wheel mounted in the revoluble member at its other end and adapted to receive impact of the pressure medium after it leaves the first mentioned wheel, and means operable by the impulse wheels to impart rotation to the revoluble member.

3. A turbine engine comprising a casing, a revoluble member mounted in said casing and having a pressure medium supply conduit and an outlet, impact members mounted in said revoluble member to successively receive the impact of the pressure medium as it passes therethrough, means operably connecting the impact members aforesaid with the casing whereby said revoluble member is caused to rotate, and other means carried by the said member coöperating with the casing and arranged to be acted upon by the pressure medium to impart supplementary rotary movement to said member.

4. A turbine engine comprising a casing having a plurality of peripheral abutments, a revoluble member mounted in said casing and having a pressure medium supply conduit therefor, an impulse wheel mounted in said member to receive the impact of the pressure medium, means operable by the impulse wheel to impart rotation to the revoluble member, and a nozzle carried by said member arranged to direct the pressure medium against the abutments aforesaid to supplement the rotative action imparted to the revoluble member by the impulse wheel aforesaid.

5. A turbine engine comprising a casing, a shaft journaled in said casing and having a pressure medium supply conduit, a revoluble member carried by said shaft having chambers therein each provided with inlet and outlet passages and said member also

having an outlet port, impulse wheels rotatably mounted in the chambers aforesaid and comprising a plurality of blades against which the pressure medium impinges as it issues from the inlets aforesaid, gears connected to the wheels aforesaid, a gear secured to the casing interposed between and intermeshing with the gears on the wheels whereby the member aforesaid is caused to revolve, and means on the casing to receive the impact of the pressure medium as it issues from the outlet of said revoluble member.

6. A turbine engine comprising a casing, a shaft journaled in said casing and having a pressure medium supply conduit, a revoluble member carried by said shaft having chambers therein each provided with inlet and outlet passages and said member alse having an outlet port, impulse wheels rotatably mounted in the chambers aforesaid and comprising a plurality of blades against which the pressure medium impinges as it issues from the inlets aforesaid, a train of gearing connecting the wheels and casing whereby the member aforesaid is caused to revolve and turn said shaft, and means on the member coöperating with the casing whereby supplemental revolving action is imparted to the member aforesaid.

7. A turbine engine comprising a casing, formed with a plurality of peripheral abutments, a drive shaft journaled in the casing and having a pressure medium supply conduit, a revoluble member fixedly mounted on the shaft having a chamber at one end provided with an inlet passage communicating with the supply conduit, an impulse wheel mounted in the chamber against which the pressure medium impinges as it issues from the inlet passage whereby the wheel is rotated, said member having a second chamber provided with an inlet passage communicating with the chamber first mentioned, an impulse wheel mounted in the second chamber and adapted to be rotated by the pressure medium, gearing connecting the wheels and the casing whereby the revoluble member is rotated in the same direction as the rotation of the wheels, and a nozzle carried by the revoluble member aforesaid through which the pressure medium issues from the second chamber, said nozzle being arranged to direct the pressure medium against the abutments on the casing tangentially relative to the axis of rotation of the revoluble member.

8. A turbine engine comprising a casing provided with a plurality of peripheral pockets and an exhaust, a drive shaft journaled in the casing and having a pressure medium supply conduit, means carried by the casing for controlling the supply of pressure medium to said conduit, a revoluble member secured to the shaft within the casing and comprising chambers at its opposite ends, said chambers having inlet and outlet passages, countershafts journaled in the revoluble member, impulse wheels secured to the countershafts within the chambers aforesaid, said wheels comprising a plurality of radial blades against which the pressure medium impinges as it issues from the inlets aforesaid, projections formed on the ends of the blades, gears secured to the extremities of the countershafts outside of the revoluble member, a stationary gear secured to the casing and interposed between the gears on the countershafts, and a nozzle carried by the revoluble member at one end through which the pressure medium is directed against the pockets on the casing tangentially relative to the axis of rotation of the revoluble member, whereby said member may be caused to revolve by impact of the pressure medium against the blades and the pockets aforesaid.

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

WILLIAM ANDERSON.

Witnesses:
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