

W. W. WONNER.

TURBINE.

APPLICATION FILED NOV. 5, 1912.

Patented June 24, 1913.

2 SHEETS—SHEET 1.

1,065,571.

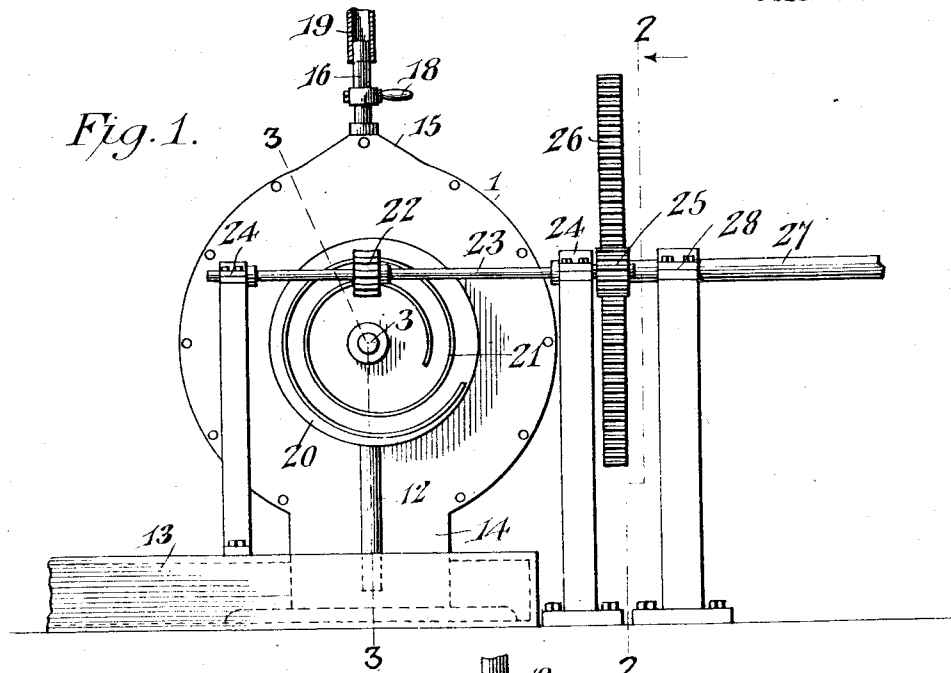
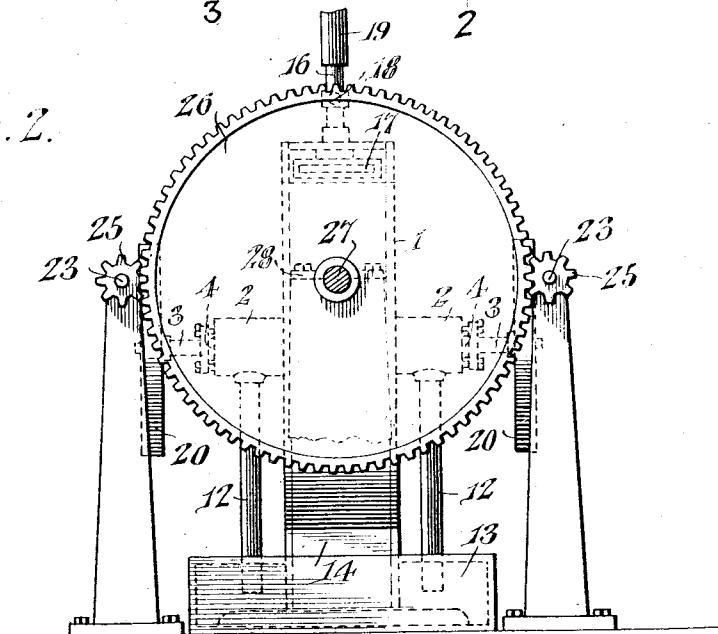


Fig. 2.



WITNESSES

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Fig. 3.

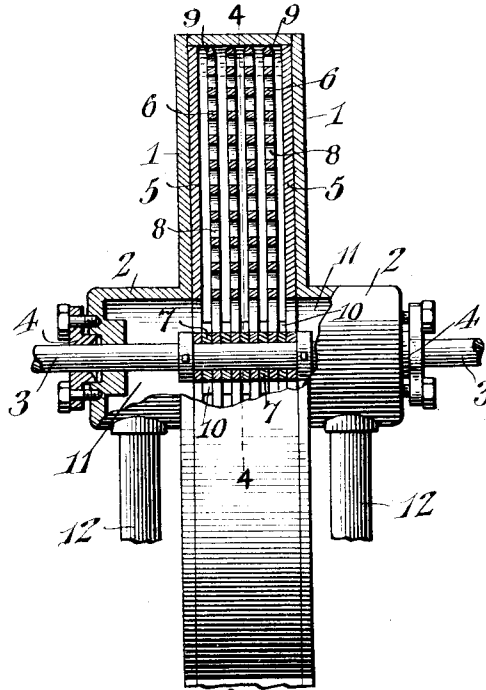
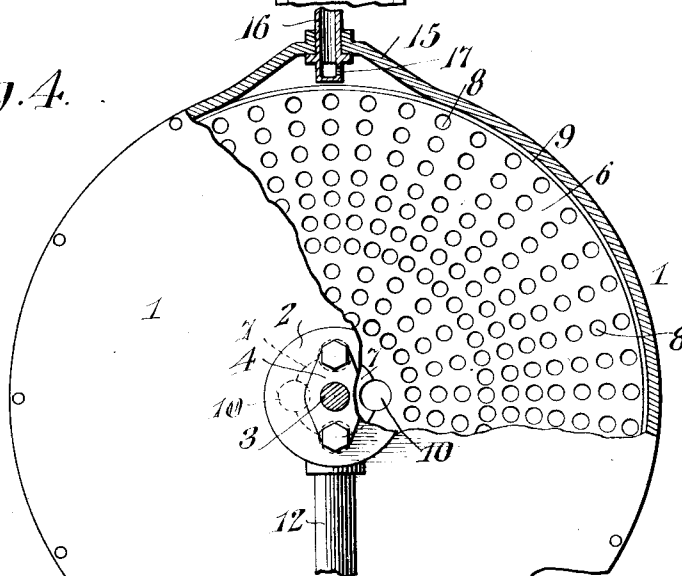


Fig. 4.



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TURBINE.

1,065,571.

Specification of Letters Patent.

Patented June 24, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM W. WONNER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented a new and useful Turbine-Engine, of which the following is a specification.

This invention has reference to improvements in turbine engines, and its object is to provide an engine of such character of high efficiency.

In accordance with the present invention there is provided a casing and rotor therein, the latter comprising a series of axially separated disks each provided with numerous passages therethrough in directions parallel with the axis of rotation, provision being made for the introduction of fluid under pressure at the periphery of the disks in the direction of rotation, and at the axial portions of the rotor there is provided an exhaust chamber or chambers of a size to avoid back pressure.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of the specification, with the further understanding that while the drawings show a practical form of the invention, it is susceptible of other practical embodiments, wherefore the invention is not confined to any strict conformity with the showing of the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention.

In the drawings:—Figure 1 is an end elevation of the engine with parts in section. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a side elevation of a portion of the engine on a larger scale than the other figures, with parts in section on the line 3—3 of Fig. 1. Fig. 4 is an end elevation of the structure shown in Fig. 3 with parts broken away and in section on the line 4—4 of Fig. 3.

Referring to the drawings, there is shown a cylinder 1 constituting the casing of the engine, and this cylinder is of appropriate diameter and axial length and is provided with central axial extensions 2. The outer ends of the extensions 2 constitute bearings for a shaft 3 and carry packing glands 4 for said shaft.

Mounted on the shaft 3 are spaced disks

5 and intermediate disks 6, the latter being separated from each other and from the disks 5 by central washers 7, so that the disks 6 are separated one from the other and from the end disks 5 by spaces equal to the thickness of the washers. The end disks 5 are imperforate, while the disks 6 have numerous perforations 8 therethrough. The perforations 8 are shown as following substantially radial lines and arranged in concentric circular series, but any particular arrangement of these perforations is not obligatory. The perforations in the disks 6 are relatively close together and are distributed throughout a zone reaching from adjacent the peripheral or marginal portions of the disks toward the center thereof. The marginal portion of each disk 6 is reduced in thickness to an approximately sharp edge, as indicated at 9.

Produced through all the disks 5 and 6 and in part through the washers 7 are passages 10 parallel with the shaft 3 and arranged in a circular series thereabout, these passages 10 opening at the ends into exhaust chambers 11 within the extensions 2 of the casing, and from these exhaust chambers lead exhaust pipes 12 which may discharge into a tank or receptacle 13 below the cylinder 1, and this tank or receptacle may in part form a support for the cylinder 1, which latter is mounted on a pedestal 14 rising above the receptacle 13.

At an appropriate point the peripheral portion of the casing 1 is formed with a radially extended offset 15 gradually merging on opposite sides of its point of greatest projection into the peripheral walls of the casing. Carried by the offset 15 is a pipe 16 entering the offset and there closed at the end except that at one side there is produced a passage 17 directed toward one or the other of the walls of the extension 15 which merge into the peripheral walls of the casing. The pipe 16 is so connected to the offset 15 that it may be turned about its longitudinal axis, a handle 18 being provided for the purpose, and connected to the pipe 16 is another pipe 19 which is assumed to be in turn connected to a source of fluid under pressure, whether such fluid be water or steam or the like.

Let it be assumed that fluid under pressure is being supplied through the pipe 19, then a stream of such fluid will issue from the passage 17 in a direction approximately

tangential to the sharpened edges of the disks 6 and assuming that the end of the pipe 16 within the enlargement 15 has a lateral extension approximately that of the distance between the disks 5 and that the passage 17 is likewise laterally extended, the stream of fluid under pressure will pass into the spaces between the disks 6 and into the perforations 8 and by frictional engagement with the disks will set up rotative movement thereof. Since these disks are all fast on the shaft 3, the latter participates in the rotative movement. The continued supply of fluid under pressure would soon raise the pressure within the cylinder 1 to a corresponding extent, but fluid under pressure finds ready escape through the passages 10 into the exhaust chambers 11 and out through the pipes 12, having in the meantime lost the greater part of its energy by reason of expansion in the spaces between the disks and in the perforations 8, so that the greater portion of the energy of the fluid under pressure becomes exhausted and is converted into rotative movement of the disks 6 and shaft 3. In practice this rotative movement attains a very high speed. The sharpened peripheral edges of the disks 6 aid in equalizing the distribution of the fluid under pressure to the several disks and the perforations 8 act similarly to cups or vanes, thus providing points of engagement of the fluid under pressure to impart rotative movement to the disks. Should it be desired to reverse the direction of rotation, it is simply necessary to turn the pipe 16 in a direction to cause the passage 17 to face the reverse of that first considered, this turning of the elongated end of the pipe 16 within the part 15 in the casing being permitted by the shape of the part 15. Since the speed of rotation is extremely high, it becomes necessary to provide a means for reducing this speed to a workable speed, and any suitable means for the purpose may be employed. One such means, but not necessarily the only means, is illustrated in Figs. 1 and 2, where the shaft 3 is shown as carrying a disk 20 having a spiral rib 21 thereon, and this rib is in engagement with a pinion 22 having teeth of appropriate form to be engaged by the spiral rib, whereby the pinion 22 has imparted to it a relatively slow movement by the rotation of the disk 20 with the shaft 3. The pinion 22 is mounted on a shaft 23 in turn mounted in bearings 24 and furthermore the shaft 23 carries a pinion 25 meshing with a gear wheel 26 mounted on a shaft 27 having suitable bearings 28, the shaft 27 constituting the transmission power shaft of the engine.

The shaft 3 carries disks 20 at both ends, and two shafts 23 with pinions 22 and 25 are provided on opposite sides of the gear

wheel 26, so that the transmission of power from the shaft 3 to the shaft 27 is equalized with respect to the gear 26.

By a speed reducing mechanism such as shown, the rotor of the engine may move at high speed without imparting excessive speed to the shaft 27.

By an engine such as described great power may be obtained from a source of energy with economy and through a structure of small size as compared with the power obtained, thus making the engine economical with respect to first cost and with respect to maintenance.

Where water is the motive fluid, it may be used repeatedly for the exhaust pipes discharge into the receptacle 13 and the water may be pumped from such receptacle to provide the requisite supply at the desired pressure in the pipe 19. When steam is the motive fluid, then the receptacle 13 may be employed as a condenser, or may even be dispensed with for the exhaust steam may be conveyed to any other desired point of disposal.

What is claimed is:—

1. In a turbine engine, a rotor comprising a series of axially spaced disks provided with a radially extended zone of perforations and exhaust passages interior to said zone.

2. In a turbine engine, a rotor comprising a series of disks spaced apart axially, each disk having a radially extended zone of perforations terminating adjacent the marginal portion thereof and having the side walls at the marginal portion exterior to said zone of perforations approaching to form an approximately sharp periphery.

3. A turbine engine comprising a cylindrical casing having central axial extensions inclosing chambers communicating with the interior of the casing, and a rotor mounted in the casing, said rotor being provided with a shaft having bearings in the axial extensions of the casing, and said shaft carrying a series of disks spaced apart axially with the outer disks imperforate and intermediate disks provided with numerous perforations, the rotor having adjacent the shaft a series of passages extending through all the disks and opening into the chambers in the axial extensions of the casing.

4. A turbine engine comprising a cylindrical casing having a peripheral offset, a rotor mounted in the casing and comprising axially spaced disks, and means for directing fluid under pressure to the peripheral portions of the rotor, said means being located within the offset of the peripheral portion of the casing and movable to project a stream of fluid under pressure in approximately tangential relation to the rotor in either direction of rotation.

5. A turbine engine comprising a cylin-

drical casing having a radial offset with walls gradually merging into the peripheral portions of the casing, an inlet pipe for fluid under pressure entering the offset and provided with a side outlet, said pipe being rotatable to direct the outlet to either side of a plane coincident with and radial to the longitudinal central axis of the casing, and a rotor mounted in the casing in position to be acted upon by fluid introduced thereinto.

6. A turbine engine comprising a cylindrical casing having a radial offset with walls gradually merging into the peripheral portions of the casing, an inlet pipe for fluid under pressure entering the offset and provided with a side outlet, said pipe being rotatable to direct the outlet to either side of a plane coincident with and radial to the longitudinal central axis of the casing, and a rotor mounted in the casing in position to be acted upon by fluid introduced thereinto, said rotor comprising a series of axially spaced perforated disks with the marginal edges each reduced to an approximately sharp edge.

7. In a turbine engine, a rotor having a series of axially spaced members defining circumferential channels extending from the

central portion of the rotor to the peripheral portion thereof, said members each having a zone of passages therethrough communicating with and joining the channels on opposite sides of the member and extending from adjacent the marginal portion of the member toward the central portion thereof.

8. In a turbine engine, a rotor having a series of axially spaced members defining circumferential channels extending from the axial portion of the rotor to the peripheral portion thereof, said members each having a zone of passages therethrough communicating with and joining the channels on opposite sides of the member, and said zone of passages extending from adjacent the peripheral portion of the rotor toward the central portion thereof, the spaced members of the rotor being shaped at the peripheral portions to distribute fluid under pressure received at said peripheral portions through the several channels.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM W. WONNER.

Witnesses:

NACWILL WONNER,
NESTER S. THOMAS.