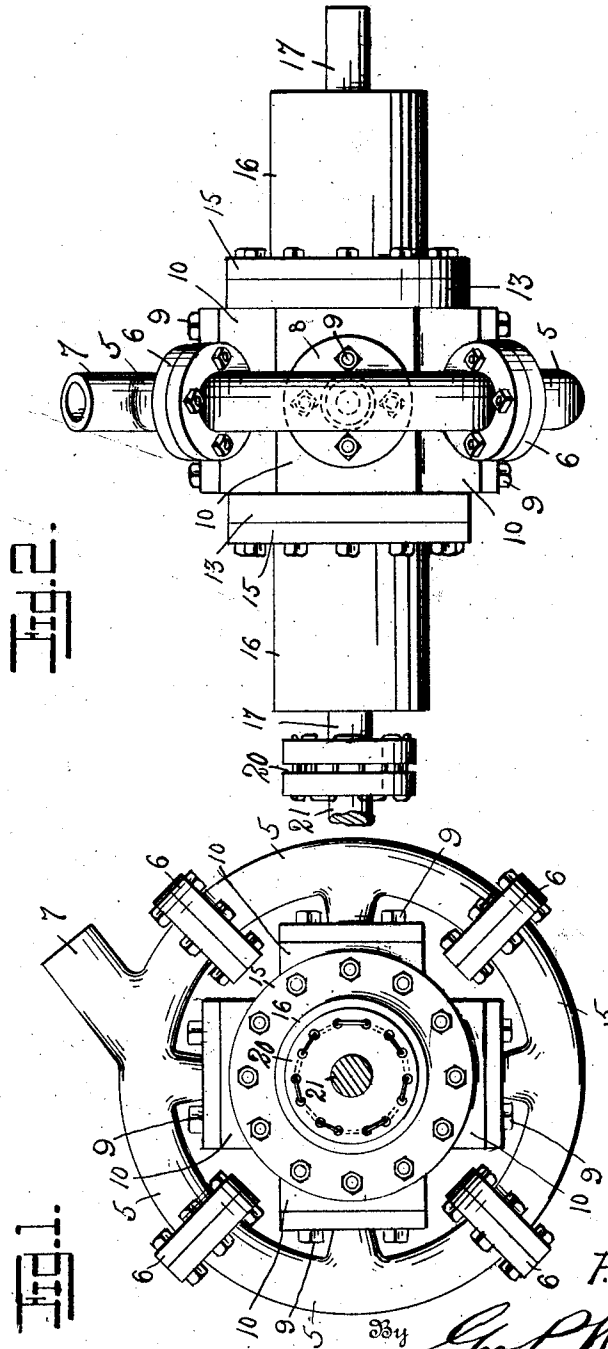


F. A. WHEELER.
AIR TURBINE.
APPLICATION FILED JUNE 21, 1920.

1,378,746.

Patented May 17, 1921.
2 SHEETS—SHEET 1.



Inventor

F. A. WHEELER,

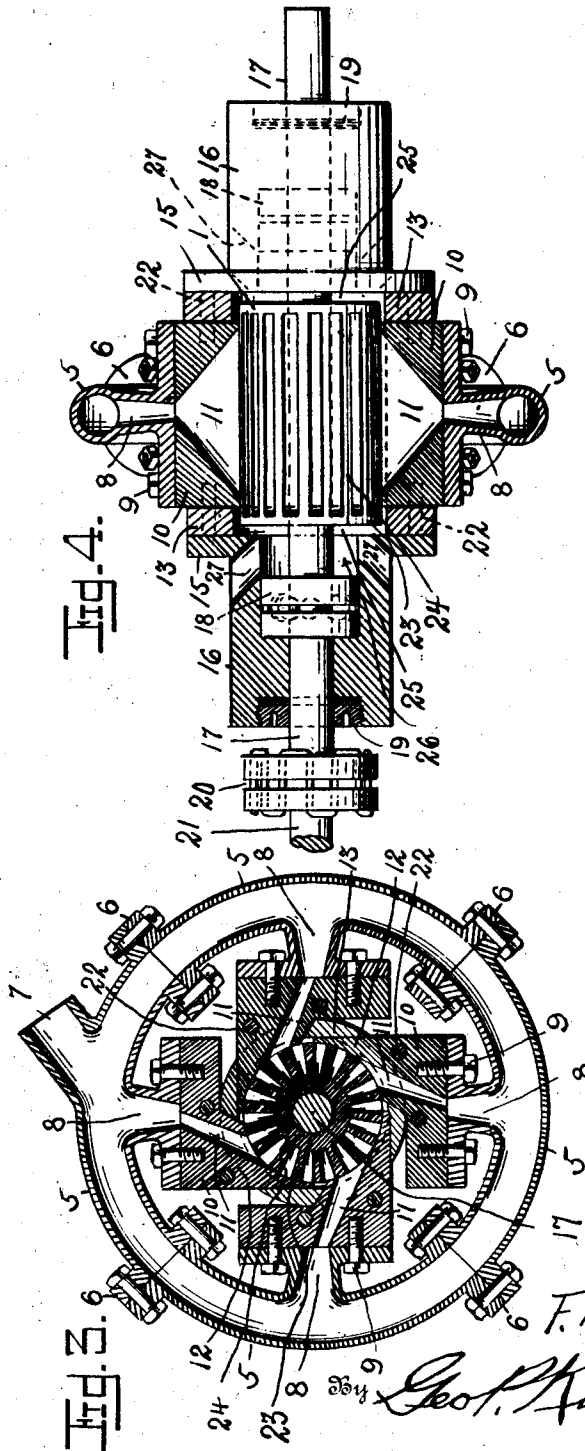
Geo. P. Kimmel,
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UNITED STATES PATENT OFFICE.

FRANK A. WHEELER, OF FLINT, MICHIGAN.

AIR-TURBINE.

1,378,746.

Specification of Letters Patent.

Patented May 17, 1921.

Application filed June 21, 1920. Serial No. 390,390.

To all whom it may concern:

Be it known that I, FRANK A. WHEELER, a citizen of the United States, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Air-Turbines, of which the following is a specification.

This invention relates to improvements in air turbines of the inward flow type and has for its principal object to provide a motor of this type wherein the air inlet and exhaust ports are so arranged with relation to the rotor as to afford a high degree of power and speed efficiency with a minimum vibratory tendency of the rotor.

A further object resides in the simple construction and compact assembly of the parts of the turbine and in the provision of an air conducting system affording a uniform distribution of air over maximum impinging blade surface.

With these and other objects in view, the invention consists in certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims, and in the drawings illustrative of the preferred embodiment of the invention.

Figure 1 represents a side elevation of the improved turbine.

Fig. 2 represents a front elevation thereof.

Fig. 3 represents a vertical sectional view taken transversely with relation to the axis of the rotor, and,

Fig. 4 represents a vertical sectional view taken at right-angles to Fig. 3.

Referring to the drawing in detail, wherein similar reference numerals designate corresponding parts throughout the several views, the numeral 5 indicates the main circular air supply pipe which is preferably constructed in quarter sections and assembled by the flanged joints 6 suitably packed to render them fluid tight. At one point throughout its circumference the circular supply pipe 5 is connected with a feed branch 7 designed for connection with a storage tank or other supply of highly compressed air (not shown).

The circular supply pipe is provided internally at uniform intervals with flanged extensions 8 disposed radially with relation to the axis of the pipe and connected by bolts 9 with a series of blocks 10 in which are formed inwardly flaring distributing

air ports 11 communicating with the radial extensions 8 of the supply pipe.

At their points of juncture with the flanged inner terminals of the sections 8, the blocks 10 are of substantially rectangular form whereas the inner terminals of the blocks surrounding the relatively large inner terminals of the ports 11 are reduced and tapered as at 12 and are snugly fitted in appropriately spaced and shaped openings formed in the side wall of the cylinder 13.

The opposite ends of the cylinder 13 are flanged and bolted or otherwise rigidly secured to the flanged terminals 15 of the cylinder heads 16 which latter constitute bearings for the rotor shaft 17, preferred types of thrust resisting devices 18 being interposed between the heads and shaft. Packing glands 19 are provided at the terminals of the heads 16 to prevent leakage of air between said heads and the shaft and the latter is connected at one terminal by a shaft coupling 20 with a driven shaft 21.

Owing to the tapered form of the extensions 12 of the air outlet blocks 10, a tight joint may be established between the latter and the openings of the cylinder 13 and in order to rigidly maintain the blocks in position between the flanges of the cylinder, dowel pins 22 are inserted in apertures in the flanges and in registering recesses provided in the opposite sides of the blocks.

The rotor 23 is supported upon the shaft 17 in the cylinder 13 and is provided in its circumferential space with a series of uniformly spaced longitudinal recesses defining a plurality of substantially radial vanes or blades 24. The reduced inner terminals 12 of the inlet blocks are extended into relatively close relation to the periphery of the rotor 23 and are curved concentrically therewith whereas the ports 11 in said blocks are arranged substantially tangential to the face of the rotor to insure proper impingement of the air upon the blades 24.

As indicated in Fig. 4, the blades 24 are of slightly greater length than the relatively wide inner terminals of the ports 11 to permit the air to readily escape from the pockets between the blades. A space 25 is provided between the rotor and the internal face of the cylinder 13 to permit the air to escape through the chambers 26 between the ends of the rotor and the thrust

bearings 18. Outwardly inclined exhaust ports 27 are provided in the cylinder heads 16 through which the air is finally discharged from the turbine.

- 5 In operation, the air entering the pipe extension or branch 7 is uniformly distributed to the several inlet blocks 10 through the pipes 5 and 8 and, discharging from the relatively large inner terminals of the ports 10 11 impinges upon the blades 24 of the rotor producing rotary movement of the latter. Subsequent to deflection of the air by the blades, the air is admitted to the chamber 26 and finally discharged through the several ports 27 at the opposite sides of the rotor.

The preferred embodiment of the invention is disclosed in the drawings and set forth in the specification, but it will be understood that any modifications within the scope of the claims may be made in the construction without departing from the principle of the invention or sacrificing any of its advantages.

25 What I claim is:

1. A turbine comprising a cylinder, detachable blocks fitted therein having inlet ports, a circular air supply pipe, inwardly directed radial branch pipes connected with 30 the supply pipe and communicating with the ports of the blocks, flanges carried by the branch pipes seated against and secured to the blocks, and a rotor journaled in the cylinder.

35 2. A turbine comprising a cylinder having flanges at the opposite terminals thereof, blocks removably fitted in the wall of the cylinder and confined between the flanges thereof and provided with inlet ports, means 40 removably locking the blocks in position, means for supplying air to the ports of said blocks, heads secured to said flanged cylinder provided with internal chambers and exhaust ports communicating therewith, and

a bladed rotor arranged in the cylinder and 45 rotatably supported in the heads.

3. A turbine comprising a slotted cylinder having flanged terminals, blocks arranged about the cylinder having tapered extensions fitted in the slots therein, said 50 blocks having inlet ports, means for supplying air to said inlet ports, heads secured to the flanged terminals of the cylinder and having exhaust ports communicating with the interior of the cylinder, and a rotor arranged in the cylinder journaled in said heads. 55

4. A turbine comprising a longitudinally slotted cylinder provided with flanged terminals, blocks arranged about the cylinder and confined between the flanges, said blocks 60 being provided with tapered extensions fitted in the slots of the cylinder and having tapered inlet ports therein, means for supplying air to the ports of said blocks, means 65 for securing said blocks between the flanges of the cylinder, heads connected with the flanged terminals of the cylinder and provided with exhaust ports communicating with the interior of said cylinder, and a 70 rotor journaled in said cylinder.

5. A turbine comprising a circular supply pipe provided with inwardly directed radial extensions, blocks provided with ports communicating with said extensions, said circular 75 pipe being of sectional detachable form, a cylinder receiving the inner portions of said blocks and communicating with the ports therein, means securing said cylinder to said blocks, a shaft, heads secured to the 80 terminals of the cylinder and supporting said shaft, a rotor arranged on the shaft internally of the cylinder, said heads being provided with exhaust ports communicating with the interior of the cylinder. 85

In testimony whereof I affix my signature hereto.

FRANK A. WHEELER.