F. W. OMAN.

TURBINE ENGINE.

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1,329,626. Patented Feb. 3, 1920.

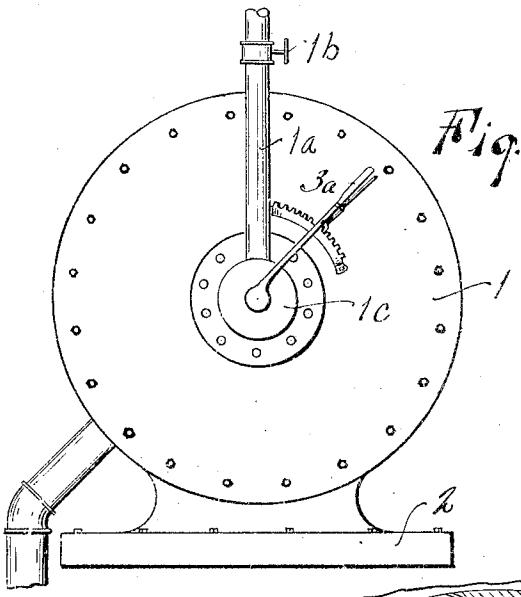


Fig. 1

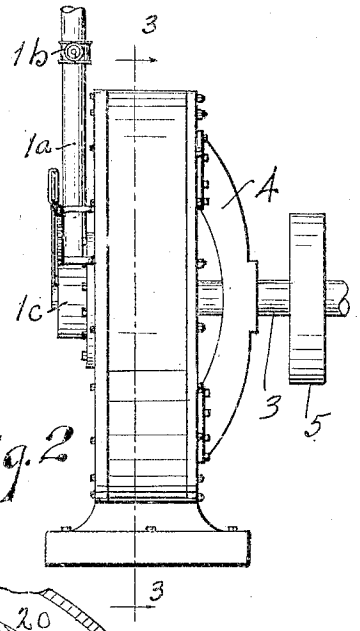


Fig. 2

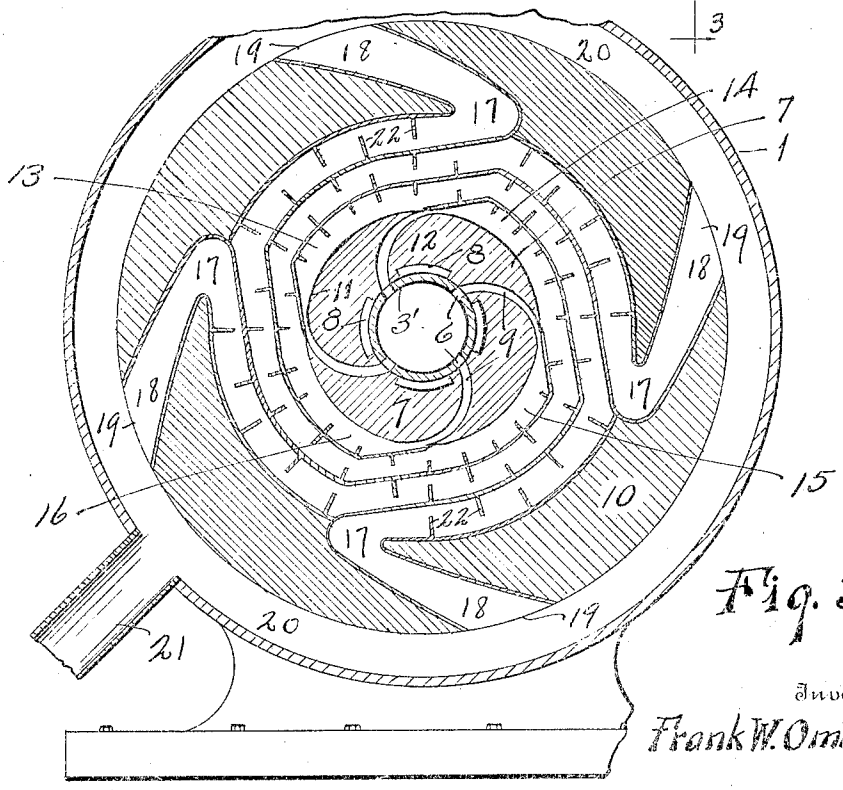


Fig. 3

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TURBINE-ENGINE.

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To all whom it may concern:

Be it known that I, FRANK W. OMAN, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Turbine-Engines, of which the following is a specification.

The present invention relates to an improved construction of turbine engine, of the center feed type, that is simple in both construction and operation, compactly arranged, and efficient in performing the required functions of this type of engine, and the invention more particularly contemplates an improved form of rotor or rotary piston involving novel combinations and arrangements of the steam channels and passages through the rotor, and also in certain other combinations and arrangements of parts as will be hereinafter set forth and claimed.

In the accompanying drawings one complete example of the physical embodiment of the invention is illustrated, the same being constructed and arranged according to the best mode so far devised for the practical application of the principles of the invention.

In the drawings Figure 1 is a side view of a turbine engine embodying the subject matter of the present invention.

Fig. 2 is an edge view of the engine of Fig. 1.

Fig. 3 is a vertical sectional view of the engine, on line 3—3 of Fig. 2.

In the preferred form of the invention the usual cylindrical drum or casing 1 is utilized, having the base 2 and made up of suitable material, and also equipped with the central, driven shaft 3 supported and rotatable in the journal bearing 4, and furnished with the balance wheel 5.

The engine is of the center feed type, and steam is supplied to the engine through the feed supply pipe 1^a provided with the usual regulating valve 1^b, and the steam enters the engine through the steam chest 1^c, located at the center of the drum or casing, and incasing the tubular portion 3′ of the rotary valve which controls admission to the engine. The rotary valve may be positioned within the casing or chest by the valve lever 3^a at the outside of the drum, to adjust the radial ports 6 of the valve with relation to the fixed head 7 in which the valve revolves. In order to equalize the pressure on the rotary valve to insure its free motion, recesses 8 are provided in the inner wall or bearing face of the head, so that steam may enter these recesses, as the valve revolves, through the ports in the valve, thus providing a steam pressure on both the inner and outer walls of the tubular valve.

There are four ports, spaced around the periphery of the rotary valve, and there are four spiral passages 9 in the bearing head 7 adapted to register with these four ports, and extending from the inner bore of the head through the outer periphery thereof with their outlet openings equally spaced around the periphery of the head, to carry the steam to the rotor or rotary piston 10 which revolves on the fixed head 7.

There are four channels spirally arranged in the piston, overlying each other in groups of three, and each channel increases in cross area as it diverges from the center of the engine, extending about three-quarters or 270° around the axis of the engine, where a sharp bend 17 is provided, and then the channel assumes a reversed, tangential or spiral form with a rearward extension 18 which is funnel shaped and terminates at 19 or opens into the annular chamber 20 within the casing or drum and serves to deliver the exhaust steam from the piston in the direction that it will not retard the piston or cause a back pressure and the funnel shape serves to allow the steam to rapidly expand and lose its force should there be an excessive amount at that point. This chamber is the exhaust chamber 20 for steam and has an exhaust pipe 21 connected thereto.

Within the spiral channels 13 to 16 are fixed blades or vanes 22 that are staggered or arranged to project from alternate walls of the channels, and it will be understood that the expanding steam, as it passes through valve, head, and rotor or piston, impinges against these vanes, as it seeks an outlet, with the resulting condition that the piston is revolved. The final action of the escaping steam at the bends 17 gives an impetus to the rotor, and then the steam passes through the reversed exhaust channels to the exhaust chamber and thence to the exhaust outlet pipe, as described.

Claims:

1. The combination with the inclosing casing, the rotor therein forming an annular exhaust chamber, and the fixed bearing

head for the rotor having spiral passages therethrough, of a rotary valve within the head having ports to register with the passages, and spirally arranged passages extending through the rotor provided with abutments, said rotor having suitable connection with the main shaft.

2. The combination with the inclosing casing and the rotor therein forming an annular exhaust chamber with an outlet, of a fixed head centrally bored and a revoluble valve having ports to engage with passages through the head, a series of spirally arranged channels extending through the rotor and adapted to register with said passages, and each said channel having a reverse bend and exhaust channel opening into the exhaust chamber, there being abutments in the spirally arranged channels.

3. The combination with the fixed head having spiral passages therethrough and the rotary valve within the head having ports to register with said passages, of a rotor on the head having a series of overlying spiral channels and staggered vanes therein, each channel having ports to register with said passages, and each channel formed with a reverse exhaust channel, and a casing surrounding the rotor forming an exhaust chamber.

In testimony whereof I affix my signature.

FRANK W. OMAN.