April 27, 1926. 1,582,174

E. B. GALLAHER

TURBINE

Filed July 21, 1924 2 Sheets-Sheet 1

Fig. 1.

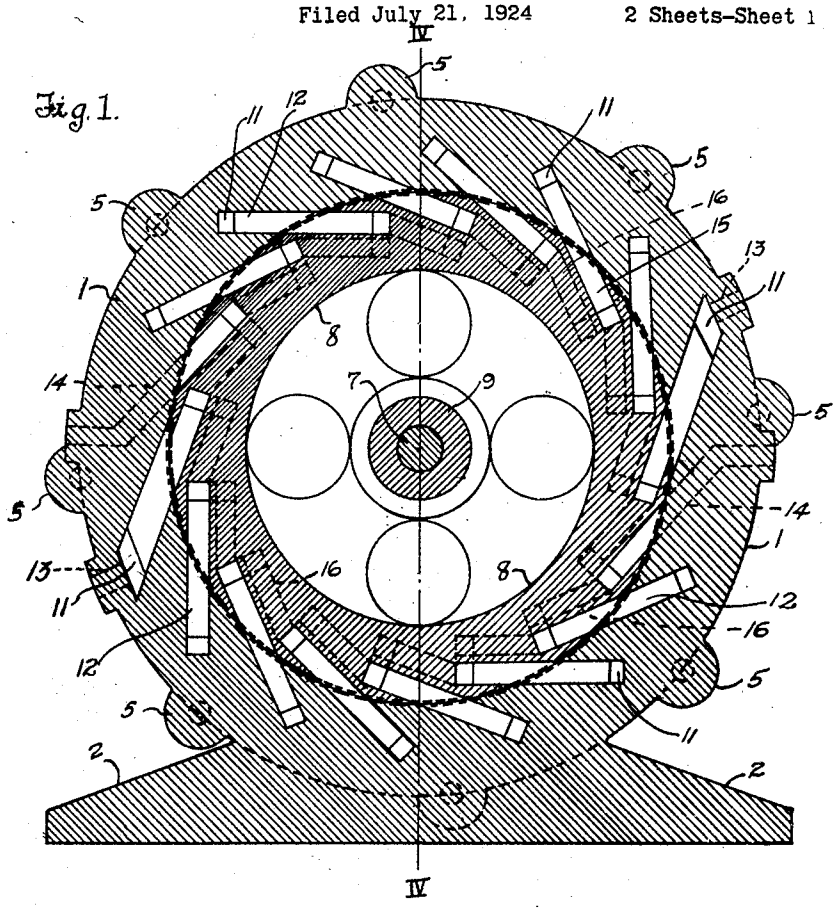


Fig. 2.

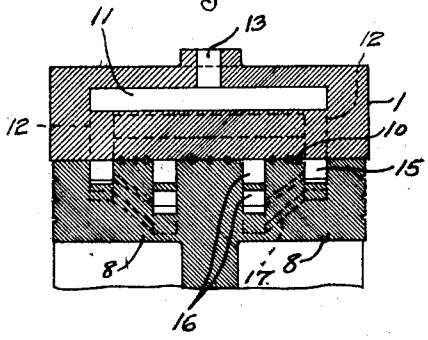
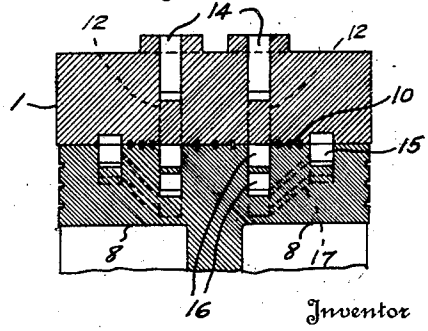


Fig. 3.



Inventor

EDWARD B GALLAHER

By Barthel & Barthel

Attorneys

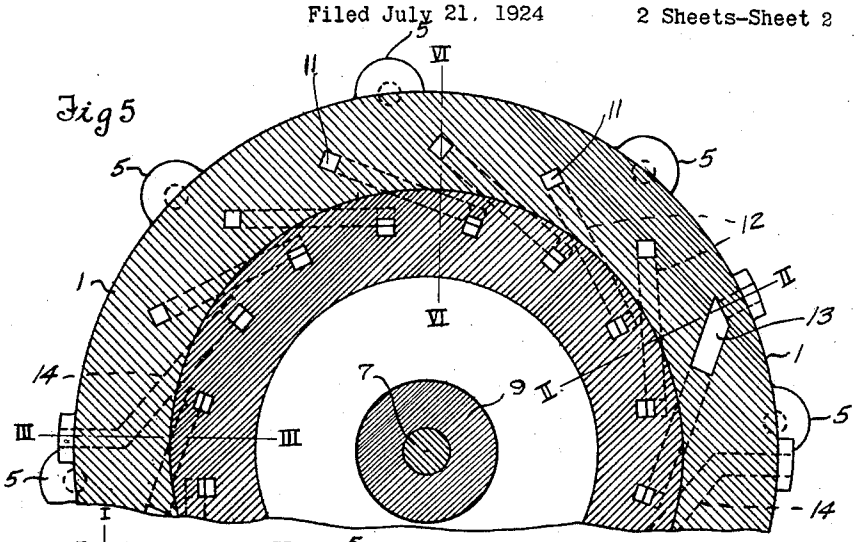
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E. B. GALLAHER

TURBINE

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Fig 5



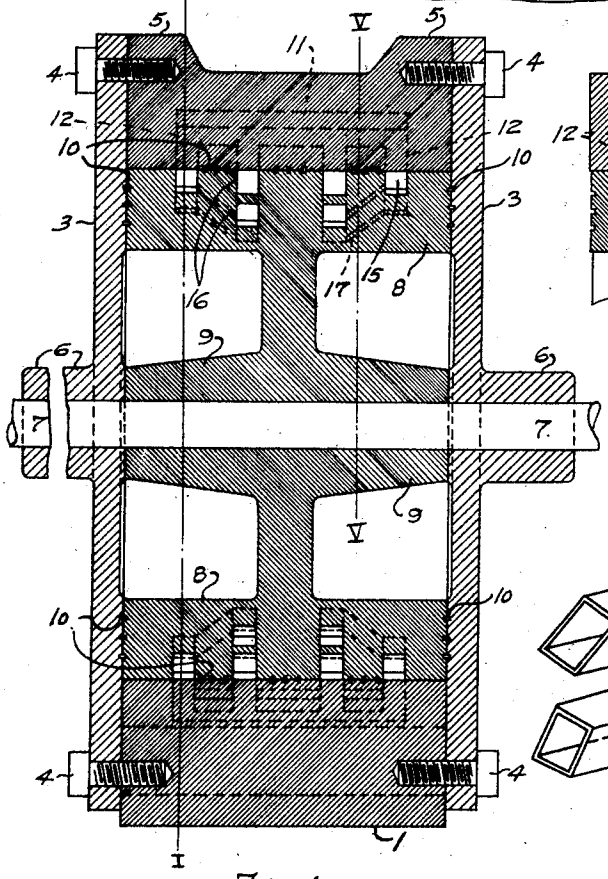


Fig 4.

Fig. 6.

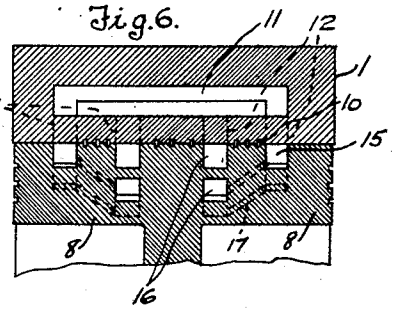
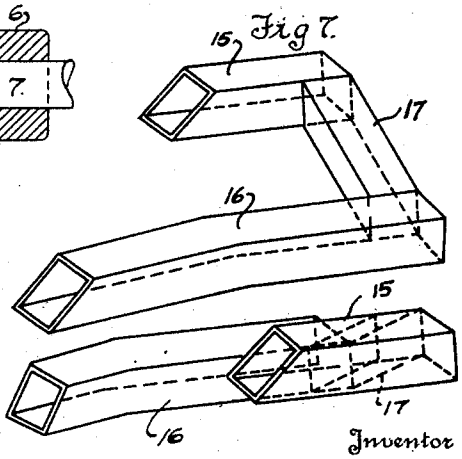


Fig 7.



Inventor

EDWARD B GALLAHER

By Parker & Burkhart

Attorneys

Patented Apr. 27, 1926. 1,582,174

UNITED STATES PATENT OFFICE.

EDWARD B. GALLAHER, OF PONTIAC, MICHIGAN, ASSIGNOR OF ONE-HALF TO JOHN L. SMITH, OF WINDSOR, ONTARIO, CANADA.

TURBINE.

Application filed July 21, 1924. Serial No. 727,160.

To all whom it may concern:

Be it known that I, EDWARD B. GALLAHER, a citizen of the United States, residing at Pontiac, in the county of Oakland and State of Michigan, have invented certain new and useful Improvements in Turbines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a power generator, and the generator may take the form of a turbine wherein steam, gas or some motive fluid may be utilized for driving the rotor of the engine, particularly the expansive force of such fluid relative to abutments disposed about the body of the engine and the rotor thereof, the abutments being arranged so that the expansive force of the motive fluid may be completely expended in the engine, before such fluid eventually exhausts from the engine.

My invention aims to provide a power generator that may be used for general purposes and be more efficient than internal combustion or other types of engines. By being more efficient a maximum amount of power may be obtained with a minimum expenditure of fuel, either in the from of an expansive fluid or a liquid under pressure.

My invention further aims to provide a power generator including a cylinder and a rotor that may be maintained liquid and fluid tight and the arrangement of the rotor is such that easy access may be had to either.

My invention further aims to provide a power generator which obviates the necessity of using valves, springs or other movable parts, and the construction entering into the invention will be hereinafter described and then claimed.

Reference will now be had to the drawings, wherein—

Figure 1 is a vertical longitudinal sectional view of the power generator taken on the line I—I of Fig. 4;

Fig. 2 is a horizontal sectional view taken on the line II—II of Fig. 5, showing an intake port of the power generator;

Fig. 3 is a horizontal sectional view taken on the line III—III of Fig. 5;

Fig. 4 is a vertical transverse sectional view of the power generator taken on the line IV—IV of Fig. 1;

Fig. 5 is a vertical longitudinal sectional view of a portion of the same taken on the line V—V of Fig. 4;

Fig. 6 is a cross sectional view taken on the line VI—VI of Fig. 5, and

Fig. 7 shows diagrammatic views of sets of passages in the rotor of the power generator.

In the drawings, the reference numeral 1 denotes a cylinder having a suitable base 2 and the end walls of the cylinder are provided with detachable heads 3 connected to the cylinder by screw volts 4 or other fastening means entering bosses 5 at the end walls of the cylinder. The heads 3 have concentric bearings 6 for a shaft 7 which is adapted to be driven by a rotor within the cylinder and from which power may be obtained for various purposes.

The reference numeral 8 denotes a rotor having a hub portion 9 mounted on the shaft 7, between the cylinder heads 3, and the periphery of the rotor 8 perfectly fits in the cylinder so that the same may freely revolve therein with a minimum space existing between the periphery of the rotor and the inner wall of the cylinder. Suitable packing rings or members 10 may be interposed between the cylinder heads 3 and the ends of the rotor, and between the periphery of the rotor and the inner annular wall of the cylinder.

The cylinder 1 is provided with circumferentially arranged transverse chambers 11 having tangentially disposed passages 12 communicating therewith, the passages being open at the inner wall of the cylinder and preferably four in number for each chamber. In the cylinder 1 are opposed radially disposed intake ports 13 and exhaust ports 14, the intake ports being opposed relative to each other, also the exhaust ports 14, so that the rotor 8 may be balanced in the cylinder. The exhaust ports are two in number at each side of the cylinder, as shown in Fig. 3, for the reason that the rotor is provided with two circumferentially disposed sets of pockets, there being two exhaust ports for each set. The sets of pockets, however, are served by a single intake port at each side of the cylinder and one of these intake ports is best shown in Fig. 2.

Considering the rotor 8, it has its periphery provided with tangentially disposed short pockets 15 and long pockets 16. All

of the short pockets are in a common plane of rotation of the rotor 8 and the long pockets 16 are in a similar common plane at the inner side of the plane of the short pockets 15. The short and long pockets are open at the periphery of the rotor and the inner ends of the short pockets 15 communicate with the inner ends of the long pockets 16 by angularly disposed passages 17, the passages being disposed at angles to the axis of the rotor, as brought out by dotted lines in Figs. 2, 3, 4 and 6. It is therefore possible to place the open ends of the long pockets 16 in the same transverse plane as the short pockets 15 of adjacent pockets. In other words, the pockets of the rotor have overlapping portions and this permits a short pocket communicating with an intake port allowing the motive fluid to pass through the long pocket and into a passage 12 of the chamber 11. The injection of motive fluid into the short pockets 15 causes the motive fluid to impinge against the walls of the short pockets, the passages 17 and the walls of the passages 12 and the chambers 11, thereby causing the rotor to turn in a clockwise direction, and as each short pocket is brought into registration with an intake port the rotor receives additional impulses.

Assuming that an expansive fluid, as steam, is employed for driving the rotor, the expansion of the steam in the pockets, passages and chambers will drive the rotor in a clockwise direction and if the expansive force of the steam is not fully expended in the first cylinder chamber which it enters, the unexpended force will be utilized in the next chamber entered by the steam.

From the foregoing it will be observed that the short pockets of the rotor successively receive motive fluid and consequently will keep the rotor in motion. The motive fluid not only utilizes the short and long pockets of the rotor as abutments, but also the chambers of the cylinder, and the arrangement of the pockets by which the intake ports will at times communicate with chambers of the cylinder is very effective especially in connection with an expansible fluid, as abutments are at all times coming into active relation for such fluid to impinge thereagainst.

It is thought that the operation and utility of the power generator will be apparent without further description, and while in the drawings there is illustrated a preferred embodiment of my invention, it is to be understood that the structural elements are susceptible to such changes, in size, shape and manner of assemblage, as fall within the scope of the appended claims.

What I claim is:—

1. A power generator comprising a cylinder having opposed intake ports and opposed exhaust ports, said cylinder having transverse chambers therein communicating with said intake ports, said cylinder having a plurality of tangentially disposed passages communicating with each chamber, and a rotor in said cylinder provided with tangentially disposed pockets adapted to communicate with the passages in said cylinder.

2. A power generator as in claim 1, wherein the rotor pockets have overlapping portions and are placed in circumferential sets in said rotor with the pockets corresponding in number to the passages of said cylinder.

3. A power generator comprising a cylinder having intake and exhaust ports and chambers circumferentially thereof, and a rotor in said cylinder having its periphery provided with short and long pockets, the long pockets being in parallel planes between the planes of the short pockets, said rotor having angularly disposed passages therein connecting the inner ends of the long pockets to the inner ends of the short pockets, all of said pockets adapted to communicate with the intake and exhaust ports and chambers of said cylinder.

4. A power generator comprising a cylinder provided with intake and exhaust ports and transversely disposed chambers communicating with tangentially disposed passages, and a rotor in said cylinder having its periphery provided with tangentially disposed long and short pockets, the short pockets communicating with the long pockets and adapted to communicate with the intake ports of said cylinder, the short pockets being disposed in a common plane, the long pockets being disposed in a common plane parallel to the plane of the short pockets, and said long pockets overlapping each other with all of said pockets adapted to communicate with the passages and chambers of said cylinder.

In testimony whereof I affix my signature.

EDWARD B. GALLAHER.