F. J. HOLLENWEGER.

Rotary Engines.

No. 142,629. Patented September 9, 1873.

Fig. 1.

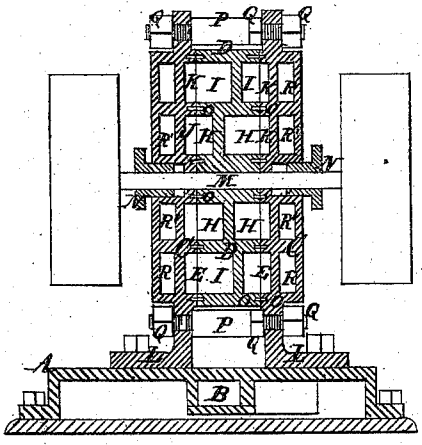


Fig. 2.

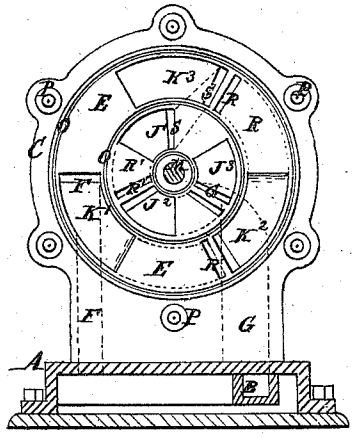


Fig. 4.

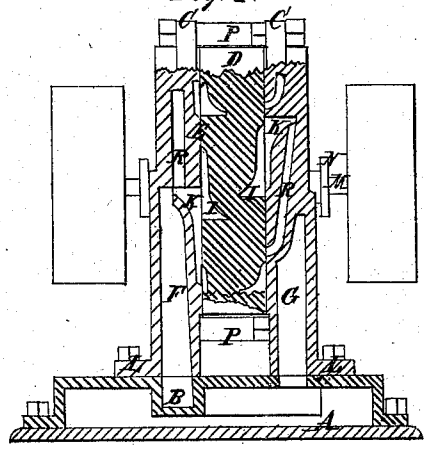


Fig. 5.

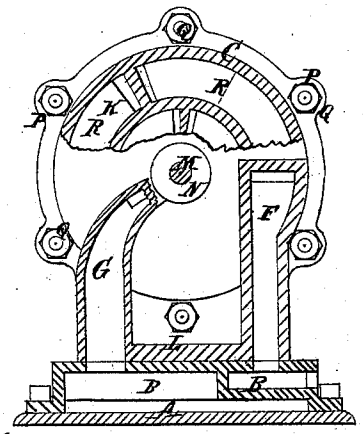


Fig. 6.

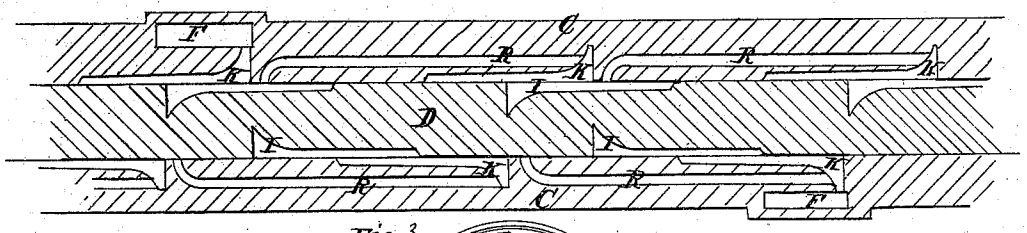
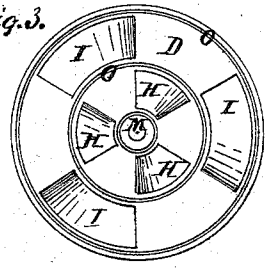


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANCIS J. HOLLENWEGER, OF NEW ROCHELLE, ASSIGNOR TO HIMSELF, JOSEPH MARTIN, AND CHARLES F. SPAULDING, OF NEW YORK, N. Y.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **142,629**, dated September 9, 1873; application filed May 24, 1873.

To all whom it may concern:

Be it known that I, FRANCIS J. HOLLENWEGER, of New Rochelle, in the county of Westchester and State of New York, have invented a new and useful Improvement in Rotary Engines, of which the following is a specification:

In the accompanying drawing, Figure 1 is a vertical central longitudinal section of my improved engine. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a face view of the piston of the same. Fig. 4 is a detail longitudinal section of the same taken through the induction and eduction passages. Fig. 5 is a detail cross-section of the same taken through the induction and eduction passages, and part of the steam-chest being removed. Fig. 6 is a diagram, showing a plan view of the cavities of the piston and steam-chest, and the steam-conducting passages between the said cavities.

This invention relates to two steam-chambers and a rotary piston arranged between them, having similar spiral cavities in their adjacent faces, said chambers being provided with passages for the induction and eduction of the steam, and with passages for conducting the steam from the inlet to the outlet, passing successively through the cavities, so as to retain the steam and cause it to act by expansion upon the piston, causing said piston to make several revolutions before said steam reaches the outlet. The steam, acting upon both sides of the piston, balances it and limits its friction. The chambers are provided with bolts to enable them to be accurately adjusted to faces of the piston, and with grooves for containing water of condensation for lubricating said faces and packing them steam-tight.

The engine thus constructed is inexpensive in manufacture, the parts being nearly ready when cast, and requiring but little work to finish and fit them.

A represents the bed-plate of the engine, which is made in two parts, and hollow to form a chamber to receive the exhaust steam of the engine, and through which is formed a passage, B, for conducting the live steam to the induction-passages of the engine. C C are the two steam-chests, between the faces E E of which the piston D revolves. Each of the steam-chests C has an induction-passage, F, connected with the passage B, and has an eduction-passage, G, connected with the chamber of the bed-plate A. The opposite faces of the piston D have radial spiral cavities H arranged within a circle of half the radius of the piston, and another series of similar cavities, I, between said circle and the periphery of the piston. In the face E of each steam-chest C are also formed two series of cavities, J and K, similar to and corresponding with the cavities H I of the piston D. Upon the base of each of the steam-chests C is formed an outwardly-projecting horizontal flange, L, by means of which it is bolted to the bed-plate A. The piston D is mounted upon and attached to a shaft, M, which passes through and has its bearings in the steam-chests C, and is provided with stuffing-boxes N to prevent the escape of steam. The adjacent faces of the piston D and steam-chests C are accurately fitted and ground to each other to prevent steam from escaping between them. To further guard against the escape of steam, a small ring-groove, O, is formed in each face near its periphery, which grooves are designed to receive the water of condensation from any steam that may get between said adjacent faces, and thus pack them. In case the steam between the adjacent faces of the piston and steam-chests be not sufficient to do this, the said grooves O may be connected by small tubes or passages with the chamber in the bed-plate, so that they may be supplied by the exhaust steam. The two steam-chests C are connected with each other, and held in proper position upon the piston D, by stud-bolts P, which pass through the flanges of the said steam-chests, and are provided with set-nuts Q to enable them to be regulated as required to prevent the escape of steam while allowing the piston to revolve freely. When the live steam is admitted to the engine it enters the passage B, and passes thence through the induction-passages F into the cavities K^1 K^1, from which it enters the cavities I I upon the

opposite sides of the piston D, as the said cavities I pass over the said cavities K^1, and thus propels said piston. Forward of each of the cavities K^1 is a passage, R, leading to the face of the piston D close to the succeeding cavity K^2, so that steam passes into the cavity I of the piston after said cavity I has passed the cavity K, causing the steam from said cavity I to pass into the cavity K^2. A similar passage, R, leads from each of the cavities K, except the last one, K^3, from which a passage, S, leads to the first cavity J^1 of the inner circle or series of cavities J. Each of the cavities J, in the same manner as the cavities K, is provided with a passage, R′, except the last one, J^3, which communicates directly with the eduction-passage G. The length of all the cavities and the spaces and passages between them, upon both the steam chests C and piston D, are about equal.

By this construction the steam from the induction-passage F upon each side of the piston D passes successively from cavity K to K of the steam-chest C, acting upon the cavities I of the piston D, and from the last cavity K it passes successively through the cavities J of the steam-chests, acting upon the cavities H of the piston. From the last cavity J the steam passes into the eduction-passages G, and escapes thence into the exhaust-chamber of the plate A.

The steam-chests and piston may be provided with one, two, three, or more series of cavities and passages, and the number in each series may be varied as desired.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The steam-chests C, provided with induction-passages F, one or more series of cavities, K J, one or more series of conduction-passages, R S, and eduction-passages G, in combination with the rotary piston D, provided with one or more series of cavities, I H, substantially as herein shown and described.

FRANCIS J. HOLLENWEGER.

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