J. M. POLSLEY.

ROTARY ENGINE.

No. 181,981. Patented Sept. 5, 1876.

Fig. 1.

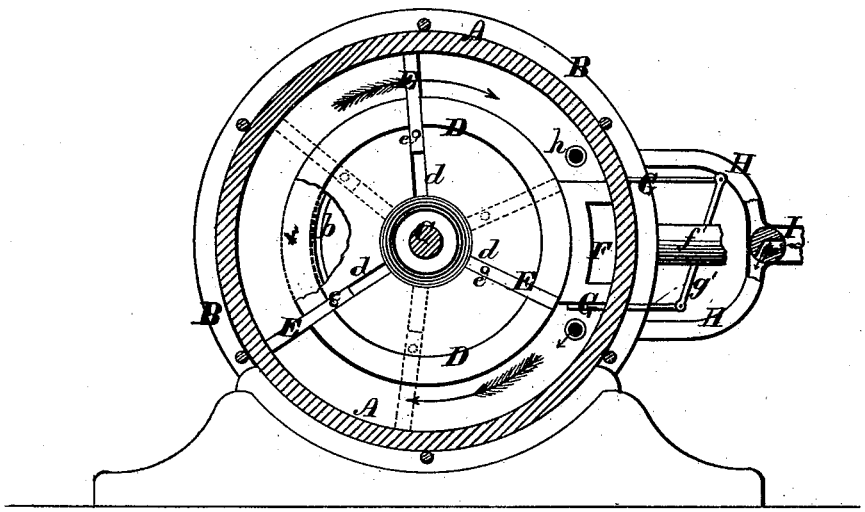
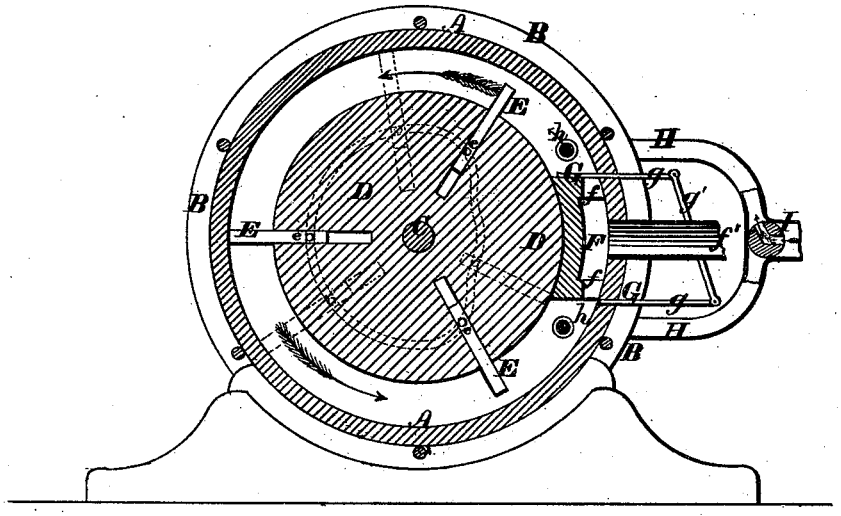


Fig. 2.



WITNESSES=

Jas. R. Critchinson

John R. Young.

INVENTOR.

James M. Polsley, by

Brindle and Lochie Attys

UNITED STATES PATENT OFFICE.

JAMES M. POLSLEY, OF GALLIPOLIS, OHIO.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **181,981**, dated September 5, 1876; application filed February 24, 1876.

To all whom it may concern:

Be it known that I, JAMES M. POLSLEY, of Gallipolis, in the county of Gallia, and in the State of Ohio, have invented certain new and useful Improvements in Rotary Steam-Engines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a side elevation of my improved engine with its head removed, so as to afford a view of the interior arrangement of parts; and Fig. 2 is a central section of said engine in a line at a right angle to the axis of the piston-head.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to render practicable the employment of steam for the production of a rotary motion, without the intervention of the usual reciprocating pistons and connecting-rods; and to this end it consists, principally, in the relative arrangement of the induction and eduction ports, substantially as and for the purpose hereinafter set forth. It consists, further, in the means employed for controlling the admission of steam to and emission of steam from the cylinder, substantially as and for the purpose hereinafter shown and described.

In the annexed drawing, A represents the casing of my engine, constructed in the form of a cylinder, and having each of its ends inclosed by means of a head, B, in the usual manner. Journaled within the heads B and B, at the axial center of the cylinder A, is a shaft, C, upon which is secured a piston-head, D, that fills the space between said heads, and, radially, has about three-fourths the dimensions of the interior of said cylinder. At equidistant points within the periphery of the piston-head D are provided three or more radial longitudinal grooves or slots, *d* and *d*, which have parallel sides, and contain each a correspondingly-shaped metal plate, E, that is fitted closely therein, and is capable of being moved radially inward or outward. Within each edge of each plate or piston E, near its inner end, is provided a stud, *e*, that projects laterally outward, and is contained within a groove, *b*, which is formed within the inner face of the contiguous head B, said groove being concentric with the periphery of the piston-head D about two-thirds of its length, while the remaining portion inclines inward toward the axial center of said piston, as shown by Fig. 2. Within one side of the cylinder A, directly opposite to the depressed portion of the groove *b*, is placed a chamber, F, which extends between the heads B and B, and between the periphery of the piston-head D and the wall of said cylinder, and at its point of contact with said piston-head, fits closely, so as to produce a joint which is substantially steam-tight. The chamber F communicates with the open air through a pipe, *f'*, that passes radially outward through the cylinder A, while an opening or port, *f*, provided within each side of said chamber, and closed by means of a valve, G, furnishes communication between the interior of the former and said cylinder.

Steam is admitted to the cylinder A through two ports, *h* and *h*, one of which is located upon each side of the chamber F, and with each of said ports is connected a steam-pipe, H, that, preferably, unites with the pipe H from the opposite port, and at their point of connection said pipes are provided with a three-way cock, I, which enables steam to be admitted to or cut off from either pipe at will.

The device is now complete, and operates as follows: One of the exhaust-ports *f* is opened, and steam is admitted through the port *h* upon the opposite side of the chamber F, when said steam, pressing against the nearest piston E, which has its end in contact with the inner periphery of the cylinder A, moves said piston forward, and with it the other pistons and the piston-heads.

As each piston approaches the exhaust-chamber F it is withdrawn radially by the depressed portion of the groove *b*, and after passing said chamber, is moved radially outward again, until its end bears against the inner periphery of the cylinder, and is in position to receive the pressure of the steam.

At the instant a piston commences to draw inward, as it approaches the exhaust-chamber, the steam confined between its rear side and the front side of the next piston in its rear, is permitted to escape into and through

the exhaust-port, by which means one portion of the periphery of the piston-head is free from pressure, while the opposite portion of said head receives the full pressure of steam, which latter, being confined between the stationary walls of the exhaust-chamber and the adjacent pistons, moves the latter and said piston-head in a forward direction.

To reverse the motion of the engine, it is only necessary that the positions of the valves which control the induction and eduction ports should be changed, and in order that the last-named valves may be more readily manipulated, their stems *g* and *g* are pivoted at their outer ends to or upon opposite ends of a lever, *g'*, so that by moving the latter in either direction one of said valves will be opened, and the opposite one closed.

While this device is intended for use in driving mechanism by the employment of steam, it can be used for elevating water; but in the latter case it must be driven, the double sets of induction and eduction ports dispensed with, and a single port of each kind substituted therefor.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the piston-head D, provided with the radial pistons E, E, and E, the cylinder A having its induction-ports *h* and *h* and its eduction-ports *f* and *f* arranged with relation to each other, in the manner and for the purpose substantially as specified.

2. In combination with the cylinder A, the steam-pipes H and H, joined together and controlled by one valve, the chamber F having the ports *f* and *f* and pipes *f'*, and the valves G and G connected together and operated simultaneously, substantially as and for the purpose shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of February, 1876.

JAMES M. POLSLEY.

Witnesses:
GEO. S. PRINDLE,
S. F. AUSTIN.