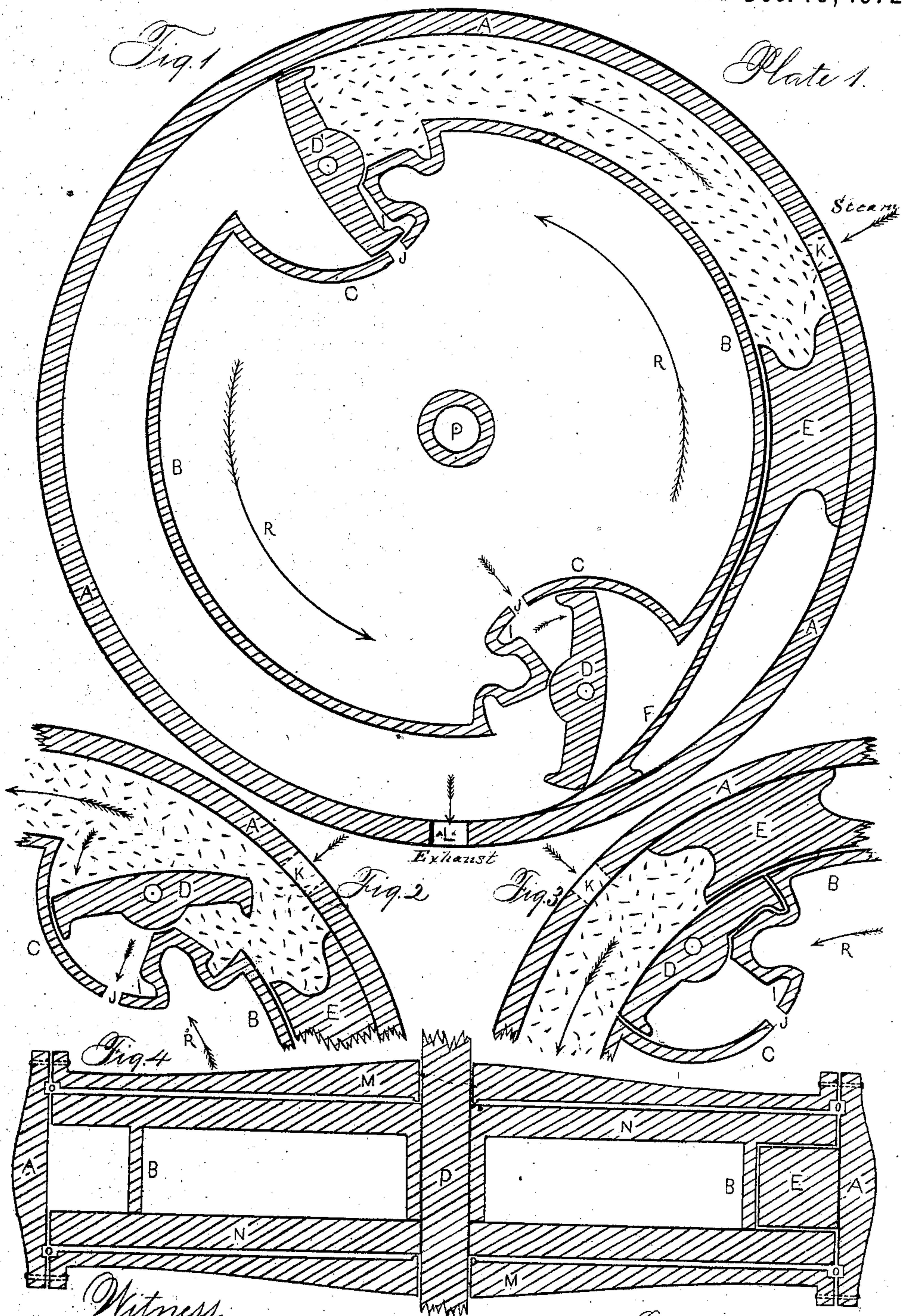


W. P. KIDDER.
Rotary-Engines.

No. 133,861.

Patented Dec. 10, 1872.



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UNITED STATES PATENT OFFICE

WELLINGTON P. KIDDER, OF NORRIDGEWOCK, MAINE.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. 133,861, dated December 10, 1872.

To all whom it may concern:

Be it known that I, WELLINGTON P. KIDDER, of Norridgewock, in the county of Somerset and State of Maine, have invented a new and useful Rotary Steam-Engine; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, which is hereby made a part of this specification, in which—

Figure 1 is a plan view of my invention with cover removed; Fig. 2 is a view of a segment of the same circle as shown in Fig. 1, showing the valve D closed and about to open; Fig. 3 is a view of the same segment with the valve in the opposite position; and Fig. 4 is a cross-sectional view of the cylinder of which Fig. 1 is a plan.

The object of my invention is to produce a device by means of which the power of steam may be utilized to produce a direct rotary motion upon the machinery to be driven, and thereby obviating the necessity of mechanism to reduce a vibratory motion to a revolving or circular motion, which exists in engines where the ordinary cylinder and piston are used. My invention consists of a hollow cylinder, as shown in Fig. 1, in which K represents the induction-port and L the exhaust-port. Through the center of this cylinder passes the shaft P, which not only furnishes the bearings for the cylinder, but from which also the power furnished may be communicated, by any of the ordinary methods, to the machinery to be driven. Within this cylinder above mentioned is the disk B, which has the raised center, the said disk being provided with the valve-seat C, constructed as shown, so as to permit of the vibration of the valve upon its pivot from the position indicated at D', Fig. 1, to the position shown at D, Fig. 3.

In order to describe the operation of the valves, let it be supposed that D' is nearly in the position shown at D, Fig. 3, when it is first submitted to the pressure of the entering steam. The valve is first packed by the pressure of the steam because the forward part 1 is pressed downward by the new steam, and this presses the rear end firmly up to the cam or ledge F and thus prevents any reacting or opposing back steam. As the disk rotates the valve begins to tip, as seen in D, Fig. 2,

until it assumes the position of D, Fig. 1. Being in this position, it takes the full force of the steam, and by that force is impelled to begin its circuit around the cylinder A, impelled by the full force of the steam, until it arrives at the point illustrated at L, which is the exhaust-port. When past this point it is soon affected as to position by the inclined ledge F, which, after the valve has passed a small arc of the circle described by the cylinder, operates to close the valve, or, in other words, to place it in the position indicated at D, Fig. 3. Previous to the moment in which D was closed by the ledge F, the other valve had in its turn passed the induction-port K and taken on steam, so that for a portion of the circle or rotation of the disk both valves are operating to impel the shaft P conjointly. The circuit of the cylinder A being thus again made by the disk B, as hereinbefore described, the second-named valve, D, now presents itself to or opposite to the induction-port K. The valve is now again thrown into operating position by the steam in the manner following, viz: Pressing upon the whole face of the valve as it lies flat, as is shown at D, Fig. 3, the steam at the same time passes under the rear end 1 of the valve, and so counterbalancing the force of the pressure otherwise equal over the whole face of the valve, it is instantly thrown up into operating position, or, as I term it, it is "opened."

To prevent the too forcible opening of the valve at this moment, I have so arranged the valve-seat C as to provide a compressed-air cushion for the valve when nearly open, but not till the upper or outer end of the valve has touched the inner periphery of the cylinder. A port is provided for the exit of the air over the valve-seat until such time as it may be required for the above purpose. Any steam escaping from the inner-rotating cylinder can be led to the exhaust-valve or any other convenient point for escape. The ends of the valves may be made broad, so that the contact and steam-joint may be perfect at a time before the valve is entirely opened.

I am aware of the application of N. Haskell, withdrawn April 19, 1850, for a rotary engine, and I do not claim the combination shown therein. The manner of operation of the valves is different from my invention, particularly as

to the opening of the same. The use of the steam and air to "cushion" the valve and prevent slamming is not found in the reference. The whole interior structure of the Haskell engine is very different from mine.

I do not claim, broadly, the rotary engine with the interior circle caused to revolve by the entrance of the steam against the valves; but my invention involves merely the combination set forth in the claim.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination and arrangement, in a rotary engine, of the case A with ports K L and cam F, the revolving wheel B provided with pivoted valves D D' and ports J, constructed substantially as shown, and for the purpose specified.

WELLINGTON P. KIDDER.

Witnesses:

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D. W. SCRIBNER.