J. LEAVER & J. WOCK.

Rotary Steam Engines.

No. 140,378. Patented July 1, 1873.

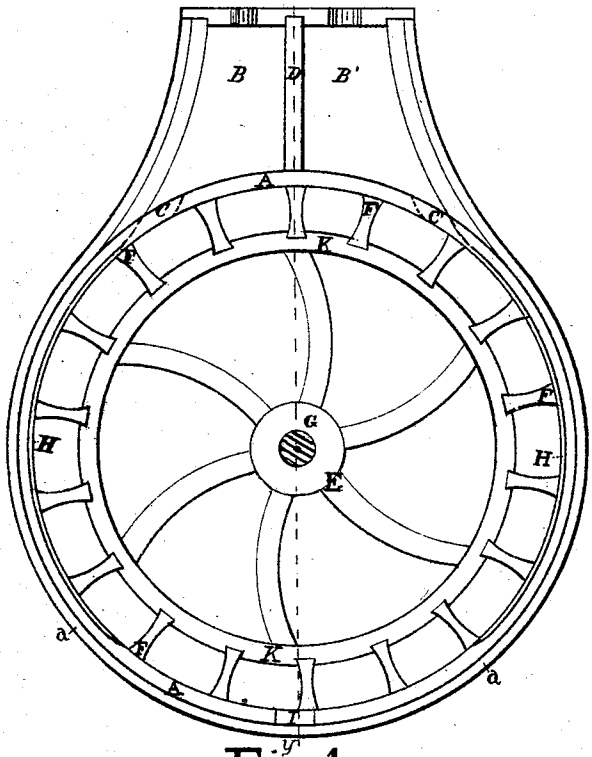

Fig. 1.

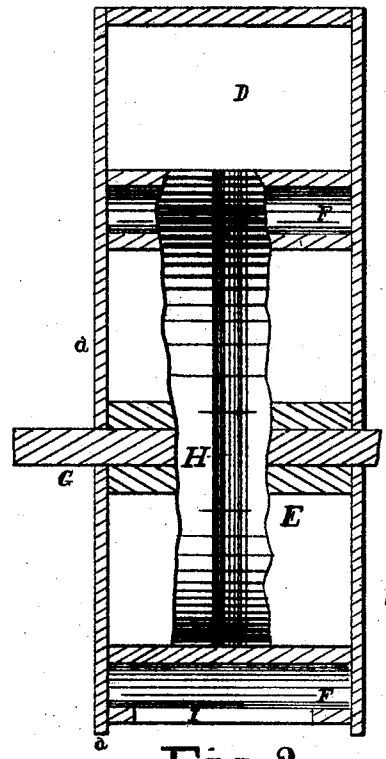

Fig. 2.

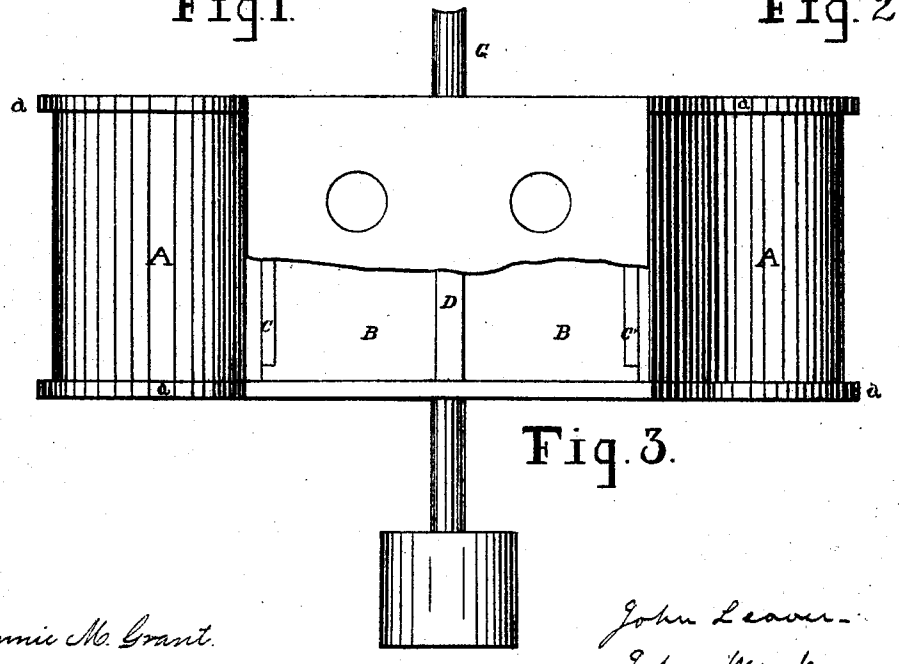

Fig. 3.

Witnesses:

Jennie M. Grant.

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UNITED STATES PATENT OFFICE.

JOHN LEAVER AND JOHN WOCK, OF CANAL FULTON, OHIO.

IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. **140,378**, dated July 1, 1873; application filed April 26, 1873.

To all whom it may concern:

Be it known that we, JOHN LEAVER and JOHN WOCK, of Canal Fulton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Rotary Steam-Engines; and the following is a full, clear, and exact specification thereof, which will enable others skilled in the art to make and use the said invention.

Our invention relates to certain improvements in the construction of rotary engines for the purpose of obtaining a cheap and simple steam motor, which will give a more effective result for a given piston area than is usually obtained in reciprocating engines. Said invention consists in the combination, with a cylinder having a steam-chest thereon, of a concentric piston-wheel having removable piston-blades, with concave faces, said wheel, with its piston-blades, being fitted steam-tight within the cylinder, and the several parts being so arranged that by the action of steam on the concave faces of the piston-blades the rotary motion is given to the piston-wheel; and also so that the piston-blades, when worn, may be removed for repair or renewal, as is hereinafter more fully shown.

In the accompanying drawing, Figure 1 is a side view of our invention, with the cylinder-head removed. Fig 2 is a section of the same through the line *y y*, with a portion of the wheel broken out to show the groove on the inside face of the cylinder. Fig. 3 is a plan of our invention, with a part of the cap of the steam-chest broken out to show the inlet ports.

A is the cylinder, and *a a* are the cylinder-heads, one of which may be cast with the cylinder, or both may be made separate, so as to be removed to adjust the parts within. B B′ is a steam-chest cast as a part of the cylinder or bolted to it, and is divided by a partition, D, into two parts, the steam being cut off from one or the other according to the direction in which it is desired to turn the piston-wheel. C C are the inlet-ports through which the steam rushes from the steam-chest to act on the piston-blades. E is a piston-wheel secured on the shaft G, which is journaled in the cylinder-heads *a a*, and having piston-blades F F so fitted in dovetail grooves in the rim K that the worn blades may be pushed out and new ones inserted. The piston-blades F F are made with concave faces, against which the steam acts to turn the piston-wheel. H H are grooves in the inner faces of the cylinder running from the inlet ports C C to within a short distance of the exhaust-port I, which is at the bottom of the cylinder, and by which the steam is kept continually acting on the piston-blades until they have passed over nearly a half circle. I is the exhaust-port by which the steam coming from either inlet-port escapes.

On steam being let into the side B, and cut off from the side B′ of the steam-chest, it rushes through the port C and strikes the upper concave face of the piston-blade F, thereby causing the piston-wheel to turn, and at the same time it forces its way along the groove H to keep a constant pressure on the piston-blades that have passed the inlet-port, till said blades have passed the end of the groove, when they have only the expansive power of the steam shut up between them to act on them.

To reverse the engine, the steam is shut off from the side B of the steam-chest and let into the side B′, when it acts in the same way to turn the wheel in an opposite direction.

What we claim as new, and desire to secure by Letters Patent, is—

The combination, with a cylinder having a steam-chest thereon, of a concentric piston-wheel having removable piston-blades, with concave faces secured to the rim thereof, the several parts being constructed and arranged substantially as and for the purpose specified.

As evidence of the foregoing specification witness our hands this 16th day of April, A. D. 1873.

JOHN LEAVER.
JOHN WOCK.

Witnesses:
F. E. CASE,
CHAS. W. BREECE.