3 Sheets—Sheet 1.

S. B. DAVIS.

Rotary-Engine.

No. 214,372. Patented April 15, 1879.

Fig 1

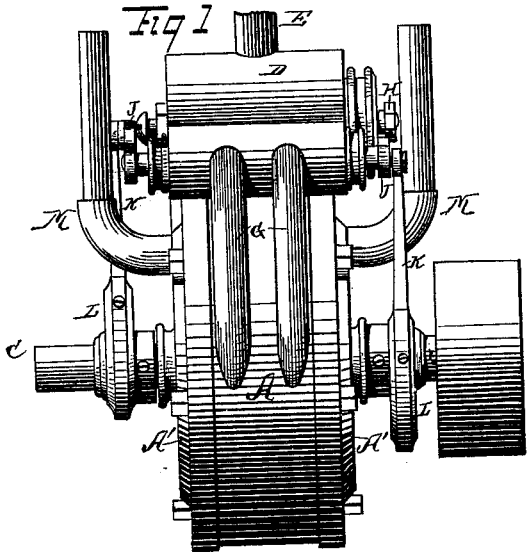
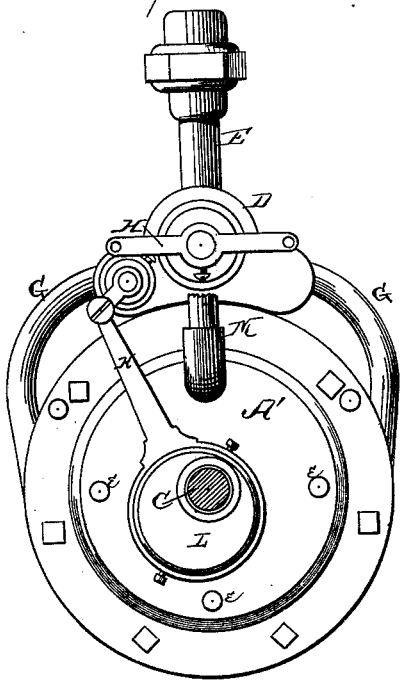


Fig 2



Witnesses.
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Fig 3

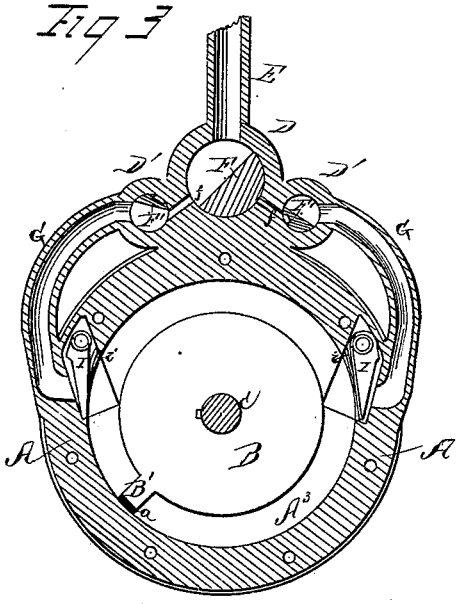
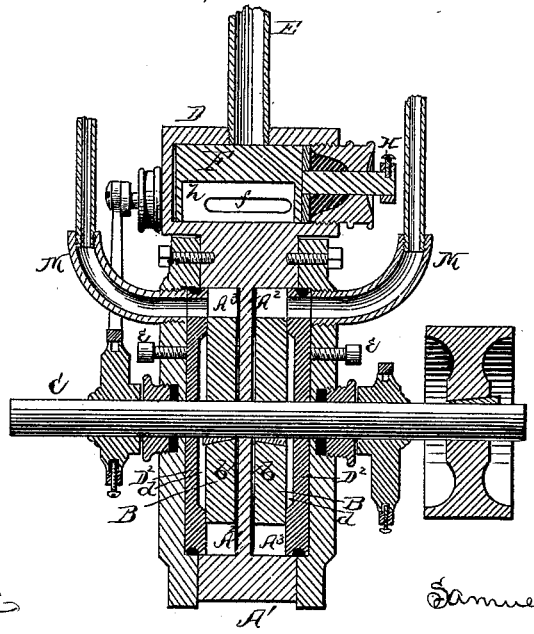


Fig 4



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3 Sheets—Sheet 3.

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Fig 5

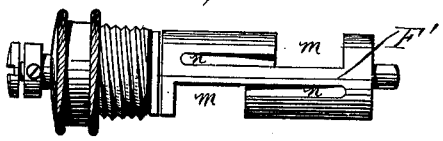


Fig 6

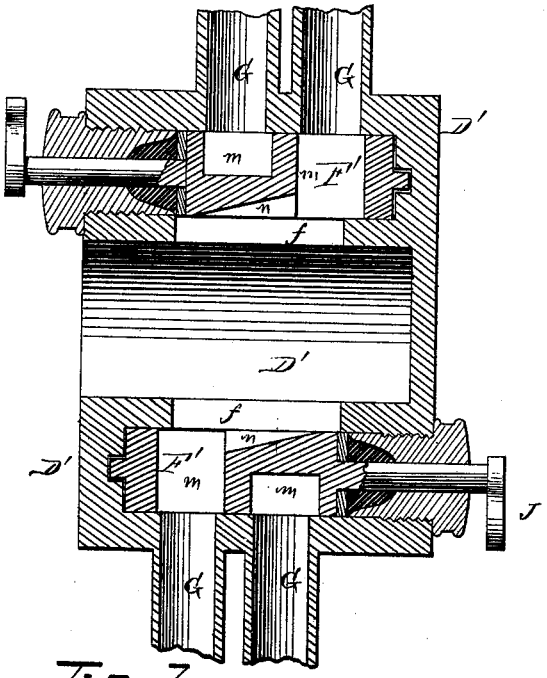
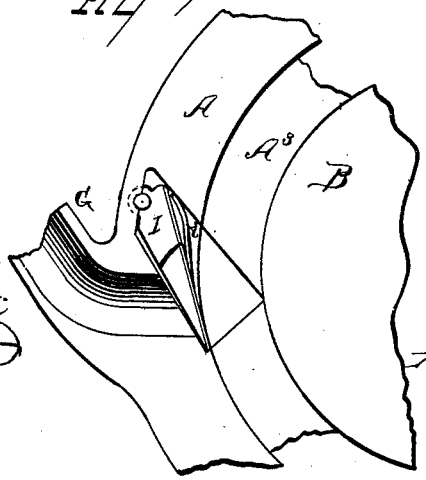


Fig 7



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UNITED STATES PATENT OFFICE.

SAMUEL B. DAVIS, OF HAMBURG, IOWA, ASSIGNOR TO HIMSELF AND GEORGE SPROUL.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **214,372**, dated April 15, 1879; application filed February 24, 1879.

To all whom it may concern:

Be it known that I, SAMUEL B. DAVIS, of Hamburg, in the State of Iowa, have invented certain new and useful Improvements in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a rotary engine, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is an end elevation; Fig. 2, a side view; Fig. 3, a central vertical section; Fig. 4, a vertical cross-section; and Figs. 5, 6, and 7 are details of parts of my invention.

A represents a cylindrical casing of any suitable dimensions, provided with heads A^1 A^1, fastened to the casing by bolts. The casing A is provided with a central diaphragm or partition, A^2, which divides the casing into two cylindrical chambers, A^3 A^3. In each of these chambers is placed a circular disk or wheel, B, of smaller diameter than the diameter of the chamber, and from said disk or wheel projects a piston, B′, which has packing *a* inserted in its end, and extends to the walls or circumference of the chamber.

The two circular disks or wheels B B are keyed or otherwise permanently secured to a central shaft, C—that is to say, the disks are so secured that the shaft must rotate with them; but when either head is removed the wheel in that chamber can be lifted off.

The central diaphragm, A^2, of the casing A is formed with a shallow annular recess, *b*, of smaller diameter than the disk or wheel B on each side, and in a recess in the inner face of each head A^1 is inserted a circular plate, D^2, having a similar recess, *d*. It will therefore be seen that the wheel B is not in contact with metal, except for a short space near the edge, thus lessening the friction.

The plates D^2 in the heads A^1 are set up by means of set-screws *e e*, in order to form comparatively tight joints between the wheel and the metal on both sides, while the steam, however, will enter the recesses *b d* and form a steam lubricant for the wheel, causing it to run smooth and easy.

On top of the casing A is a valve-box, D, into which the steam is admitted through the pipe E, and in which is situated the valve F, for starting, stopping, and reversing the engine. This valve-box D communicates, through a port, *f*, on each side, with other valve-boxes, D^1 D^1, containing the cut-off valves F′ F′.

Each valve-box D^1 communicates, by means of two pipes or channels, G G, with the two chambers A^3 A^3 of the casing, the entrance of each pipe into its respective chamber being in a recess made in the casing, and over such entrance in said recess is hung a valve, I, which is actuated by a spring, *i*, to close the entrance when no steam passes through the pipe G. The valve I and spring *i* are so arranged as to be out of the way of the piston B′ when no steam passes through the pipe G; but when steam is admitted through the pipe G the valve is by the steam thrown outward against the periphery of the wheel B, and then forms also an abutment for the steam, to cause it to act against the piston B′ and rotate the wheel in the proper direction.

The valves F F′ are cylindrical in form, and the valve F is simply cut out as shown at *h*, so that by turning the valve the steam may be admitted through either port *f* into either of the valve-boxes D^1, or may be shut off from both. On one end of the valve F is a lever or handle, H, for turning the valve either directly at this point or by suitable connections from any point desired.

Each valve F′ is provided with two ports, *m m*, and two passages, *n n*, as shown, to admit the steam from the port *f* into either of the pipes G G, and upon one end of each valve is a crank or arm, J, connected by a pitman, K, with an eccentric, L, secured on the shaft C.

The valve F being set so as to admit the steam into one valve-box, D^1, the steam passes through one of the pipes G on that side into the corresponding chamber A^3, the valve I being by the steam opened and thrown against

the periphery of the wheel B in that chamber, and the steam operating against the piston B′ causes said wheel and the shaft C to rotate.

By means of the eccentric L and its connection with the valve F′, the steam is at the proper time cut off from the pipe G through which it was entering, and admitted through the other pipe G on the same side into the other chamber A^3, to act in the same manner on the valve and piston therein.

It will be seen that the valves I are closed as soon as the steam is cut off from their respective pipes G by their springs *i*, and moved out of the way of the pistons B′, thus preventing any blows on the valves by said pistons.

To reverse the engine it is only necessary to turn the valve F so as to shut off the steam from the first valve-box D^1 and admit it into the other, when the valves I on that side will come into play in the same manner.

M M are the exhausts.

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

1. In a rotary engine, the casing A A^1, having central diaphragm, A^2, forming two chambers, A^3 A^3, the shaft C, wheels B B, with pistons B′ B′, and valve-boxes D D^1 D^1, with their respective valves and pipes, all combined substantially as and for the purposes herein set forth.

2. In a rotary engine, the combination of circular plates D^2, formed with the recess *d*, and adjusted in the head A^1, with wheel B, set-screws *e e*, and recessed diaphragm A^2, all constructed and arranged to operate substantially as and for the purposes set forth.

3. In a rotary engine, the combination of the valve-box D, with ports E *f f*, the valve-boxes D^1, pipes G G, valve F, with opening *h*, and the valve F′, with ports *m m* and passages *n n*, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

his
S. B. × DAVIS.
mark.

Witnesses:
C. H. WYNN,
H. M. SPROUL.