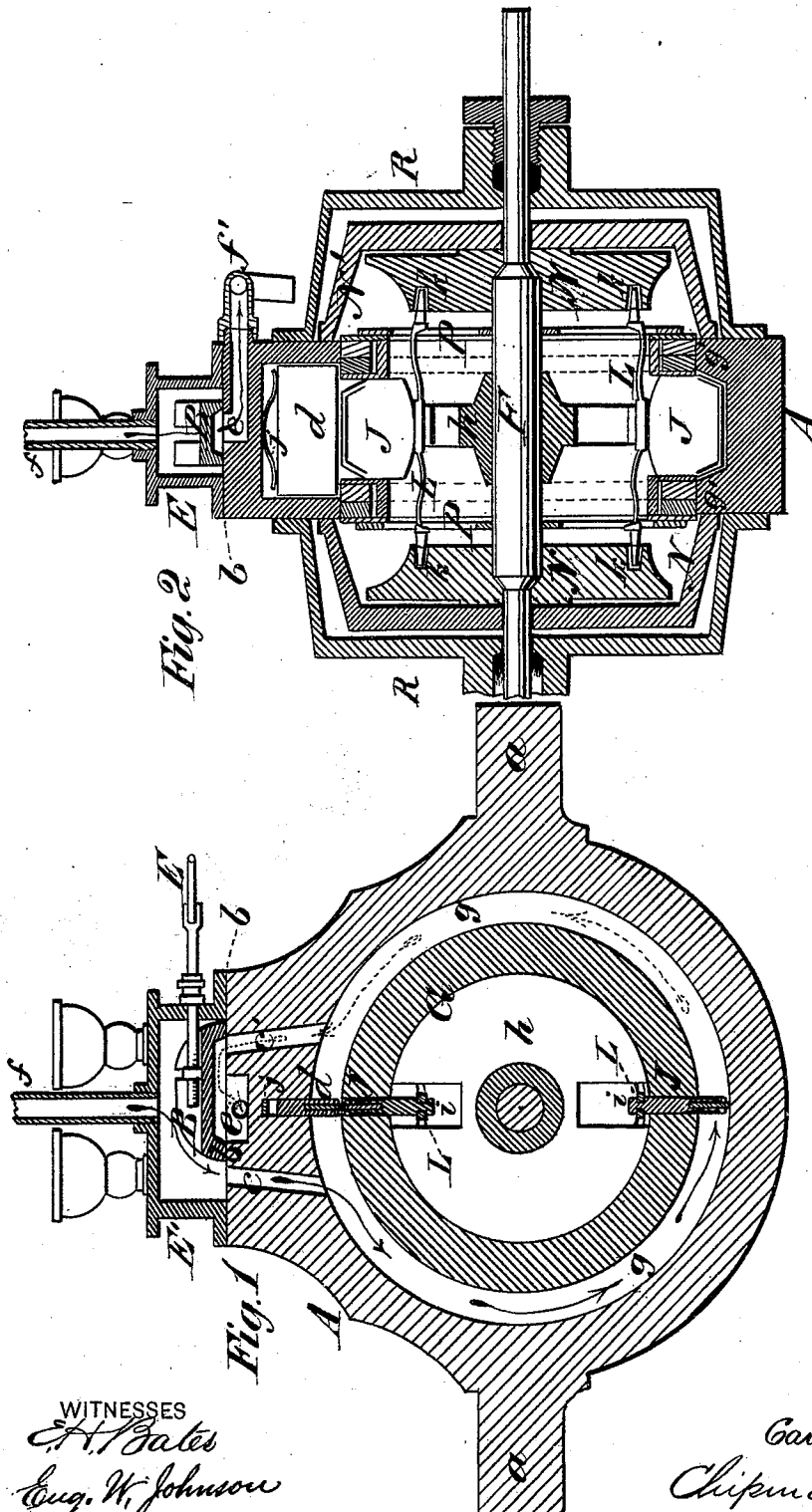


C. H. KURTZ.
 ROTARY-ENGINE.

No. 171,573.

Patented Dec. 28, 1875.



WITNESSES
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CARLES H. KURTZ, OF SOUTH DANSVILLE, NEW YORK.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **171,573**, dated December 28, 1875; application filed July 31, 1875.

To all whom it may concern:

Be it known that I, CARLES H. KURTZ, of South Dansville, in the county of Steuben and State of New York, have invented a new and valuable Improvement in Rotary Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1 and 2 of the drawings are representations of vertical sections of my engine.

This invention relates to rotary steam-engines; and it consists in attaching the piston to elastic followers, which are actuated, during the rotation of the cylinder, by means of cam-grooves formed in two stationary plates at the ends of the casing for the cylinder, as will be hereinafter explained.

In the annexed drawings, A designates the casing of the engine, which is constructed with two extensions, *a a*, diametrically opposite each other, which support the casing upon a suitable frame, and are bolted down firmly thereto. On top of the casing A is a flat valve-seat, *b*, on which is a D-valve, B, made adjustable by means of a lever, E, which is attached to a rod that passes steam-tight through one end of the valve-chest E'. From the valve-seat *b* descend two ports, *c c'*, which are on opposite sides of a cut-off, *d*, and similarly located with respect to an exhaust-passage, *e*. The relative distance of the ports *c c'* with respect to the port or passage *e* and the arched chamber of valve B is such that, when this valve B is moved in the position shown in Fig. 1, steam, entering the valve-chest E through a pipe, *f*, will follow the direction of the arrows in full lines, while the exhaust steam will be discharged through port *c'*, beneath the valve D, and escape through the passage *e*. If the valve B be reversed, the induction and eduction of the steam will be reversed, and the cylinder G inside of the casing A will rotate in an opposite direction. The engine can be reversed while it is in motion by simply sliding the valve B from one port to the other. Inside of the casing A an annular chamber, *g*, is formed, on opposite sides of which are annular flanges *g' g'*, of greater diameter than the

diameter of the chamber *g*. Inside of the casing A is the rotating cylinder G, which is constructed with a central slotted diaphragm, *h*, to the hub of which is keyed a shaft, F, having bearings in journal-boxes on the main supporting-frame. (Not shown.) The ends of the cylinder G are rabbeted to receive expansible packing, hereinafter explained, and through this cylinder radial slots are made, which are diametrically opposite each other, and in line with the slots which are through the diaphragm *h*, as shown in Fig. 1. In the said slots are applied two pistons, J J, which have suitable packing secured in their outer ends to prevent leakage. These valve-slides are attached, by means of T-shaped tenons *i*, to spring-followers L L, which pass freely through the slots in diaphragm *h*, and have anti-friction rollers on their reduced ends. The anti-friction rollers are received in cam-grooves *k*, made in two circular plates, N N. These plates N are rigidly secured, by means of yokes N', to the ends of the casing A, and they receive freely through them the shaft F. The reduced portions of the follower-springs L pass through slotted guides P, which are secured to the ends of the casing A, and which allow the follower-springs to operate without binding in their grooves *k*.

Fig. 3 shows clearly the shape of a cam-groove, *k*, in one of the plates N, the groove *k* in the opposite plate being of the same shape and radius. The upper portion of each groove *k* is depressed for the purpose of retracting the pistons J as they successively pass beneath the cut-off *d*, which latter is held down upon the periphery of the cylinder G by a spring, *j*, and packed so as to prevent leakage.

On each rabbeted or reduced end of cylinder G I apply an expansible metallic packing, for the purpose of preventing any leak of steam between it and the inner surface of the flange, against which it is pressed. This packing consists of a broad diagonally-split ring, *l*, surrounded by two narrow split rings, *n n*, the joints of which break joints with that of the broad ring *l*. The inner diameter of the rings *l* is somewhat greater than the diameter of the reduced ends of the cylinder G, and between these reduced ends and the rings *l* springs S are applied, which keep the rings

expanded, and compensate for any wear which takes place. The packing-rings are held in their places by means of rings *p*, which are screwed fast to the ends of the cylinder *G*.

The ends of the casing *A* are closed by means of caps *R R*, packed so as to prevent leakage.

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

The described piston *J J*, secured to spring-

follower rods *L L*, in combination with the cam-grooves *k*, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CARLES H. KURTZ.

Witnesses:

HENRY WEIERMILLER,
PETER KRIDLER.