G. EVENS.

Rotary-Engines.

No. 200,036. Patented Feb. 5, 1878.

Fig. 1.

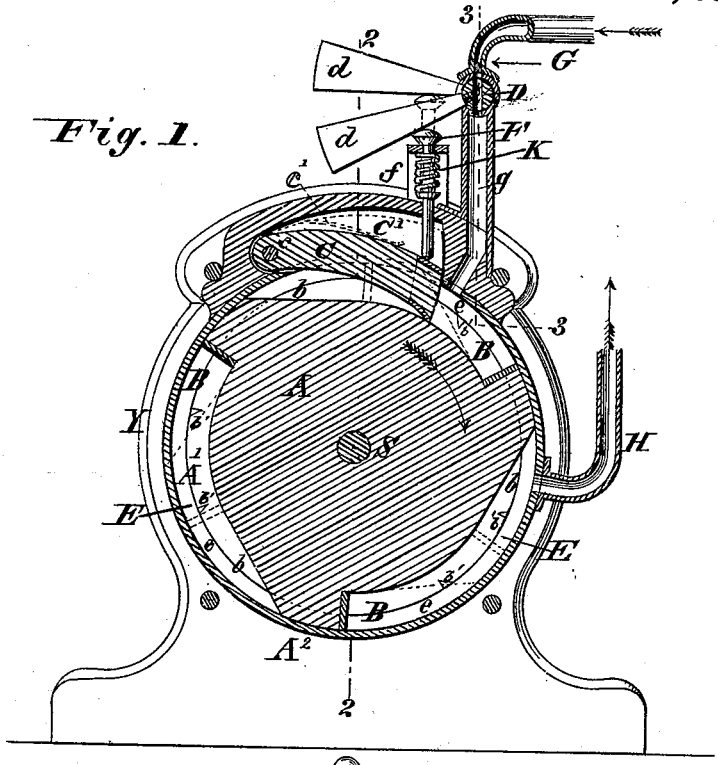


Fig. 2.

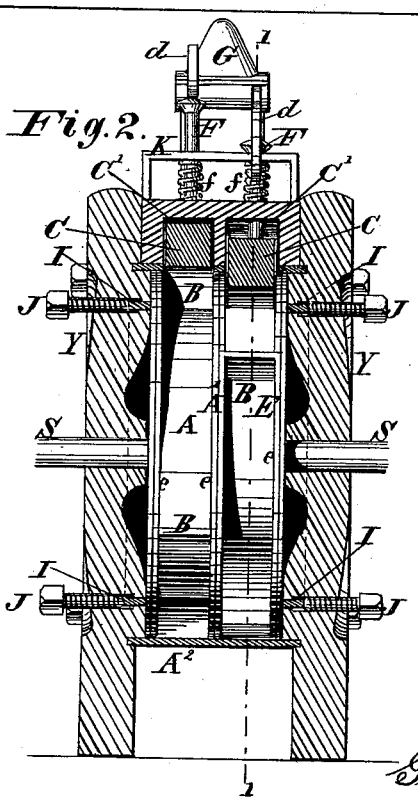
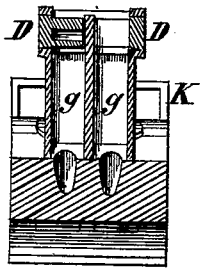


Fig. 3.



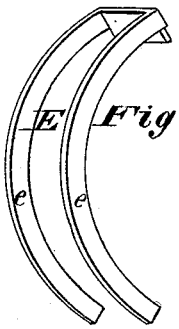


Fig. 4.

WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE EVENS, OF CLEBURNE, TEXAS.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **200,036**, dated February 5, 1878; application filed May 2, 1877.

To all whom it may concern:

Be it known that I, GEORGE EVENS, of Cleburne, in the county of Johnson and State of Texas, have invented an Improvement in Rotary Engines, of which the following is a specification:

My improvement consists, first, in a peculiar packing or frame for the recesses in the wheel. The arms of the frame are pressed outward by the steam acting on the under edges of said arms, so as to securely pack the recesses and confine the steam. As soon as the steam is exhausted the frame assumes its normal position, passing freely within the casing or drum surrounding the wheel.

My improvement consists, secondly, in providing the steam-valves with arms which are operated by means of rods located between the abutments and said arms.

In the accompanying drawing, Figure 1 is a transverse section of my improved engine on the line 1 1, Fig. 2. Fig. 2 is a sectional elevation on the line 2 2, Fig. 1. Fig. 3 is a vertical section of the valves and ports detached. Fig. 4 is a perspective view of the packing detached from its recess in the wheel.

A represents a wheel or cylinder, mounted on a shaft, S, having bearings in a suitable case, Y. The periphery of the wheel is recessed to form pistons B, leaving a central wall, A^1, between said pistons. The recesses are provided with a frame or packing, E, of any suitable material, and within this packing the abutments C operate. The abutments are pivoted at *c* within chambers C′, and may be projected by means of springs *c*′. Surrounding the wheel A is a drum, A^2, slotted and perforated to admit the heads of the abutments and the induction and eduction steam-pipes, respectively. Resting on the free ends of the abutments are rods F, which may be forced inward by means of springs *f*. D are oscillating valves, having arms *d*. These arms rest upon the heads of the rods F. G is the steam-supply pipe.

Steam is introduced to the drum through ports *g*, leading from the valves D and exhausted through pipes H. The wheel is kept from swaying from side to side by means of rings I pressed inward by screws J. A frame, K, forms a support for the rods F. The pistons B alternate on each side of the central wall A^1 of the wheel.

Excavations *b*′ are formed in the sides of the recesses beneath the arms *e* of the frame E.

Operation: One of the abutments falling into a recess in the wheel lowers a rod, F, carrying with it the arm *d* resting thereon. This action opens a valve, D, thus permitting steam to pass into the recess between a piston, B, and the head of the abutment. The steam, expanding within said recess, forces round the wheel. At the same time the arms of the frame are pressed outward against the casing A^2 by the action of the steam within the excavations *b*′, so as to securely pack the recess. The inclined portion *b* of the next piston raises the abutment, cuts off the steam from that side of the wheel, and the forward piston passing a pipe, H, the exhaust-steam escapes, and the packing or frame assumes its normal position, and passes freely within the casing or drum. As soon as one abutment commences to rise, its valve is closed, and the abutment on the other side of the wall A^1 is dropped by a piston-head passing from beneath it, thus opening the valve on the opposite side, so that a continuous pressure of steam is kept on the wheel.

It will be seen that the steam passing from the boiler to the engine passes without obstruction onto the wheel, filling up the recesses or buckets instantly, whereas, if it had to pass any valves or other obstructions, it would, of course, lose power. In this case it does not pass any obstruction, for the oscillating valves D D are opened alternately, and remain open until the abutments C C run two-thirds of the distance of the recess, when, reaching that point, the steam is cut off instantly. The steam is not cut off gradually, as in other slide-valve engines. After the abutments have passed two-thirds of the length of the recesses there is no more pressure on them, thus permitting the abutments to rise without friction.

The frame E forms a complete self-packing device, confining the steam only at the time it is in action.

Some of the advantages possessed by this form of engine are as follows: An increase in power is obtained; few parts, which are cheaply

manufactured; only a single wheel or cylinder is employed; the steam acts with continuous force upon the wheel; can be used in either a horizontal or vertical position.

When the engine is used in vertical position, as shown, the springs for projecting the abutments and for pressing the rods inward may be dispensed with, as these parts will then fall by gravity.

When the springs *f* are used, the springs *c'*, shown in dotted lines in Fig. 1, may be dispensed with.

The pistons being arranged alternately on each side of the central wall A^1, the wheel or cylinder is well balanced.

A governor can be applied on the top of the valves D, and be connected with the main shaft in any suitable manner.

In my wheel the steam-chambers are formed within the cylinder, instead of using the sides of the casing, as in previous devices, thus preventing an amount of side friction by having the steam expand within the motor.

The machine can be used in a horizontal position, and operated without the use of springs, by recessing the side of the wheel instead of the periphery, and making both recesses and abutments of suitable curve.

The engine may be stationary or portable.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. The combination of frame E, wheel A, having pistons B and abutments C, as and for the purpose set forth.

2. The combination of the frame E having arms *e*, and wheel A having pistons B, and excavations *b'* under said arms, as set forth.

3. The combination of wheel A having pistons B, valves D having arms *d*, rods F, and abutments C, as and for the purpose set forth.

GEORGE EVENS.

Witnesses:
J. K. KEATING,
M. E. DAVIE.