H. COTTRELL.

Rotary-Engine.

No. 161,207. Patented March 23, 1875.

Fig. 2.

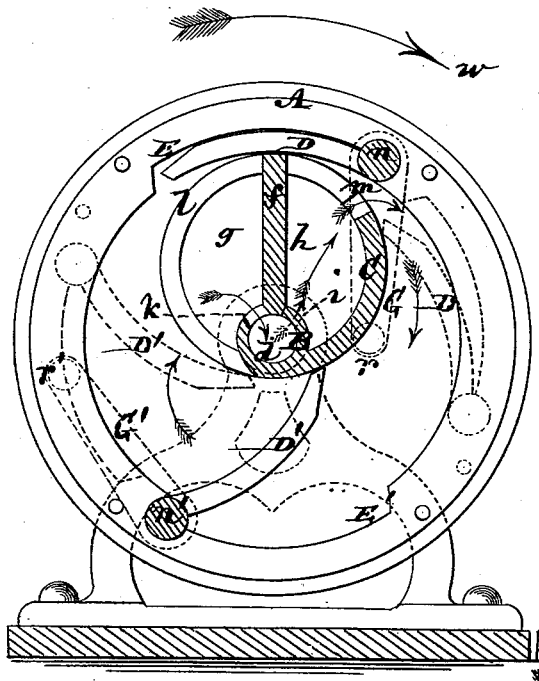


Fig. 3.

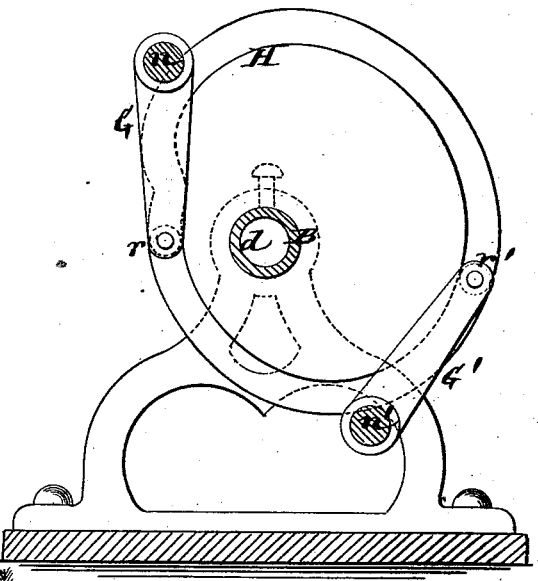
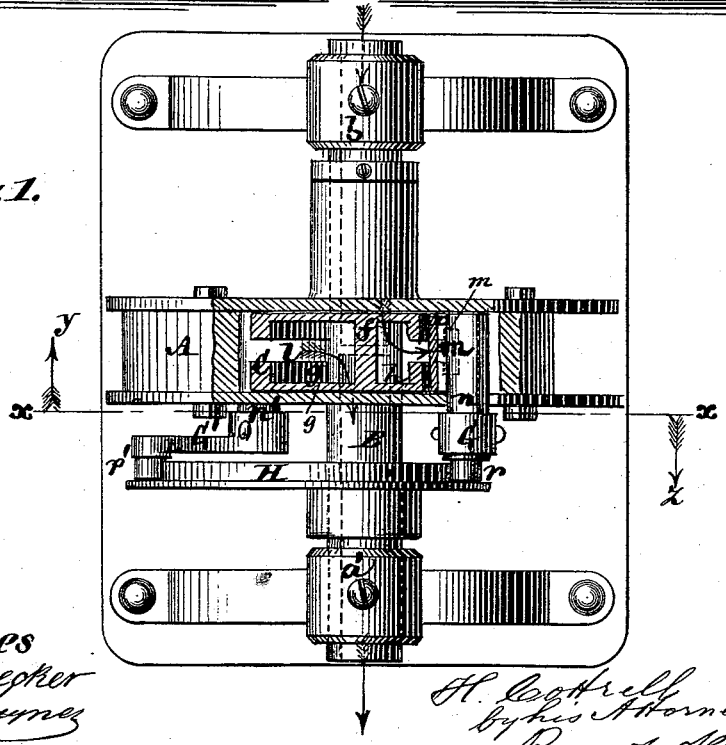


Fig. 1.



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UNITED STATES PATENT OFFICE.

HERBERT COTTRELL, OF NEWARK, NEW JERSEY, ASSIGNOR TO COTTRELL & TAYLOR, OF SAME PLACE.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **161,207**, dated March 23, 1875; application filed August 11, 1874.

To all whom it may concern:

Be it known that I, HERBERT COTTRELL, of the city of Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Rotary Engines, of which the following is a specification:

This invention relates to certain improvements in rotary engines, such as wherein the rotary cylinder is provided with swinging pistons, and employ a hollow shaft with induction and eduction passages; and it consists in constructing the stationary eccentric so as to form a fixed abutment within the rotating cylinder, said eccentric having two compartments, one for induction and the other for eduction of the steam, and constructed with an induction-port, which is made narrower at the point where it first takes steam, and broader where it ceases to admit a greater volume of steam as the increased surface of the swinging piston is presented, as hereinafter specified and pointed out.

In the accompanying drawing, Figure 1 represents a partly-sectional plan; Fig. 2, a transverse vertical section, mainly on the line *x x*, looking in direction of the arrow *y*, with the one cylinder-cover removed, and the stationary eccentric shown in section. Fig. 3 is a transverse vertical section on the same line *x x*, looking in direction of the arrow *z*.

A is the rotary cylinder of the engine, arranged to rotate, in direction of the arrow *w*, upon a stationary hollow shaft, B. This shaft B is constructed with longitudinal passages *b d*, opening, respectively, through its opposite ends, the one, *b*, of said passages forming an inlet for the steam or other propelling fluid, and the other one, *d*, a general outlet or exhaust. C is a stationary eccentric, fast on the shaft B, and of such diameter and width that it forms an abutment within the cylinder A, its outer periphery coming in contact with the inner periphery of the cylinder on one side of the shaft B. Said eccentric, which may be hollow, and be divided transversely by a partition, *f*, or be otherwise and equivalently constructed with passages corresponding to the spaces *g h* on reverse sides of the partition *f*, serves not only as an abutment, but also as a means of passing the steam to and from the cylinder A, by ports *i k*, in communication, respectively, with the inlet and outlet passages *b d* and outer ports *l m*. The one, *l*, of these latter ports, and which is an exhaust-port, may be an extended circumferential one, while the other one, *m*, of said ports, and which is an inlet-opening, may be a full cross or tangential one, with a circumferential extension in its rear to provide for a gradual and full supply of steam to either piston as the latter passes the point or surface of the fixed eccentric C, which meets or corresponds with the interior periphery of the rotary cylinder A. D D′ are the swinging pistons, attached or pivoted, at *n n′*, to the rotary cylinder A, and of curvilinear construction, conforming, as regards their inner surfaces or faces, when closed or made to enter recesses E E′ in the peripherical portion of the cylinder, with the interior peripherical surface of the cylinder. The action of either piston and of the steam in relation with it is the same, the steam acting upon the back of the piston D′, and exhaust taking place in front of said piston when the pistons D D′ are in the positions shown by full lines in Fig. 2; but when said pistons reach the positions shown for them by dotted lines in said figure, then the steam acts upon the back of piston D while it commences to exhaust from behind the piston D′ and in front of the piston D. In this way a continuous rotary motion of the cylinder A, in direction of the arrow *w*, is kept up without the aid of valves, it only being necessary to maintain contact of the pistons at their inner ends and surfaces with the stationary eccentric C during the rotation of the cylinder A, and to provide for their working in and out of the recesses E E′, as occasion requires. This may be done automatically by various mechanical contrivances; but a simple means for the purpose consists of levers G G′, fast to the pivots *n n′* of the swinging pistons, and having friction-rollers or bearing-surfaces *r r′*, arranged to travel against or over a fixed cam, H, shaped to produce the necessary in and out movements of the swinging pistons. This cam H and the levers G G′ may be cased in, so as to work under cover, and said levers be made yielding, or their rollers or bearing-surfaces provided with springs,

to conform to any irregularity of surface or action. Furthermore, to add to the durability and efficiency of the engine, the pistons D D′ may be shod or faced with steel; also, the eccentric be fitted with a steel bearing-piece.

Power may be communicated from the rotary cylinder by belt, gearing, or in any other suitable manner.

I claim—

The stationary eccentric C, forming a fixed abutment within the cylinder A, and constructed with an induction and eduction compartment, and with an induction-port, *m*, narrower at the point where it first takes steam and broader where it ceases, to admit a greater volume of steam, as described, in combination with the rotating cylinder, swinging pistons, and hollow shaft having induction and eduction passages, substantially as set forth.

HERBERT COTTRELL.

Witnesses:

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