

C. H. PALMER.
Rotary-Engines.

No. 150,350.

Patented April 28, 1874.

Fig. 6.

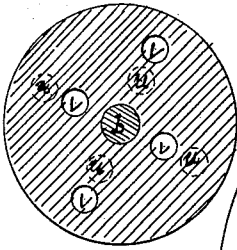


Fig. 1.

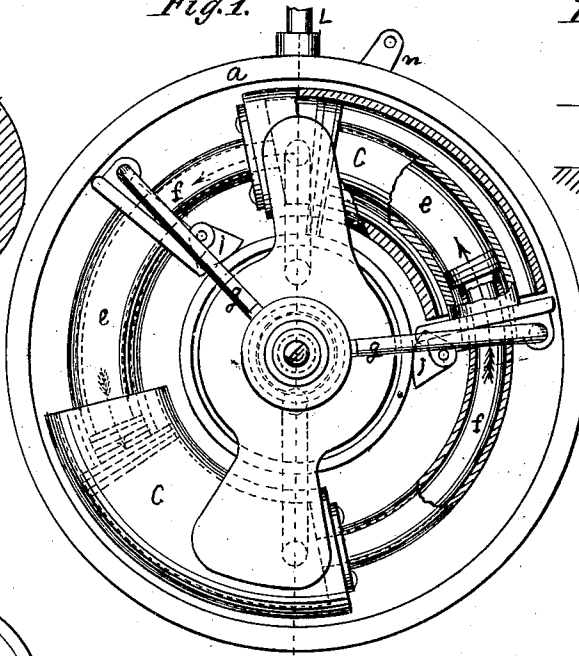


Fig. 4.

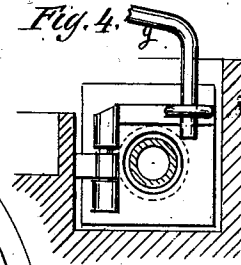


Fig. 3.

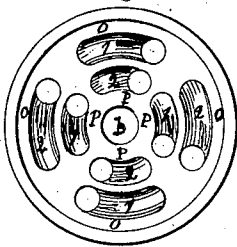


Fig. 2.

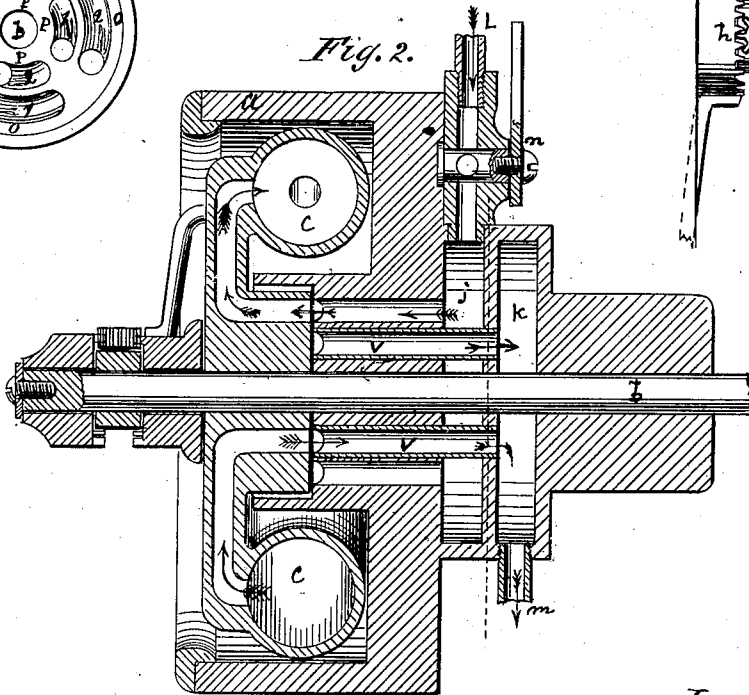
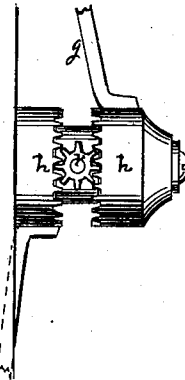


Fig. 5.



Witnesses:
Walter W. Montague
Geo. W. Ramsay

Inventor:
Charles H. Palmer

UNITED STATES PATENT OFFICE.

CHARLES H. PALMER, OF NEW YORK, ASSIGNOR TO CHARLES H. DEWEY,
OF BROOKLYN, N. Y.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. 150,350, dated April 28, 1874; application filed
February 5, 1874.

To all whom it may concern:

Be it known that I, CHARLES H. PALMER, of the city, county, and State of New York, have invented Improvements in Rotary Engines, the object of which is to furnish a cheap and economical and rapid motor for driving light machinery. The peculiarities of construction and operation are fully and clearly set forth in the following explanation, including the accompanying drawings and letters of reference marked thereon.

Figure 1 is a front view. Fig. 2 is a sectional view. Fig. 3 is a front view of the steam-ports. Fig. 4 is a sectional back view of the regulation or exhaust levers. Fig. 5 is a side view of segment-gearings, with intermediate pinion working therein. Fig. 6 represents a vertical transverse section taken between chambers K and L, hereafter explained.

a represents the outer casing; *b*, the central shaft and axis of rotation; *c c*, curved steam-cylinders; *e e*, curved piston-cylinders; *f f*, connecting-pistons; *g g*, regulating or exhaust levers; *h h*, segmental gearings, with intermediate pinion *v*; *i i*, friction-cams; *J*, steam-chamber for inlet, and *K* steam-chamber for outlet, of steam; *L*, inlet of steam, and *m* outlet of steam; *n*, steam-valve; *O*, outer circle of steam-ports; and *P*, inner circle of steam-ports. Numerals 1 and 2 represent the inlet and exhaust ports. The circulation of the steam through the various ports is indicated by arrows. All the parts within the case *a* revolve with shaft *b*, in the direction of the arrows. Pinion *r* revolves upon a bearing that is fixed in the shaft *b*, while the segment-gearings *h h*, in which pinion *r* works, are fitted on shaft *b*, so that they may remain without motion while *b* is in motion, or may exceed the forward motion of *b* when required to close up the exhaust-chamber, hereafter explained. The steam-ports are elongated, as seen in Fig. 3, and are gradually diminished in area from the moment steam is taken until it is entirely cut off, whereby steam is worked

expansively. Both steam-cylinders are supplied through *L*, and exhausts through *m*. One cylinder is always taking steam, while the other is exhausting. Each cylinder receives and exhausts alternately. *v v* are tubes, through which the exhaust-steam is conducted across the steam-chamber to the outlet, (seen in Figs. 2 and 6,) while *u*, Fig. 6, are the ports, through which live steam enters cylinders *c*.

A pawl and ratchet may be used instead of the friction-cams *i i*, to prevent back action of levers *g*.

The connecting-pistons, tubular or otherwise, are not essential to continuous revolution of steam-cylinders, as levers *g* are alternately thrown forward to close up the exhaust, by pinion *v* operating through segment-gearing *h*; but when dispensed with the head of cylinders *c'* should be closed.

From this description of the construction of this engine it is seen that, when steam is admitted between the cylinder-head of *c* and piston-cylinder head *e*, the friction-cams *i i* prevent back action of piston-cylinder *e* in the rear of the steam. Consequently cylinder *c* must advance, while piston-cylinder *e* in the rear remains momentarily at rest; but piston-cylinder *e* in front of the cylinder, taking live steam, is thrown forward twice the distance and double the velocity of the cylinder taking live steam, so as to close up the exhaust of the forward cylinder *c*. The cause of piston-cylinder *e* moving twice the distance, with double the velocity of cylinder *c* in a given time, is a result of pinion *r* acting as a short lever from the center of motion upon the long levers *g* through segmental gearings *h*. When either cylinder *c* is taking live steam a portion escapes into tubular connecting-pistons *f*, and thus aids levers *g* to close up the exhaust, then immediately exhausts backward through the same port at the moment the exhaust in cylinder *c* in the rear is being closed up by lever *g*. Cylinders *c* exhaust backward through the same chan-

nel they receive steam until reaching exhaust-tubes *v*, at which point and moment ports *u* are cut off.

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

1. The curved cylinders *c c* and piston-cylinders *e e*, in combination.

2. Levers *g g*, cams *i i*, segmental gearings *h h*, with pinion *r*, in combination with piston-cylinders *e e*.

3. Levers *g g*, cams *i i*, segmental gearings *h h*, with pinion *r*, in combination with shaft *b*, substantially as and for the purposes set forth.

CHARLES H. PALMER.

Witnesses:

WALTER W. MONTAGUE,
GEO. M. RAMSAY.