

R. L. COHEN.  
ROTATING CYLINDER ENGINE.

No. 112,688.

Patented Mar. 14, 1871.

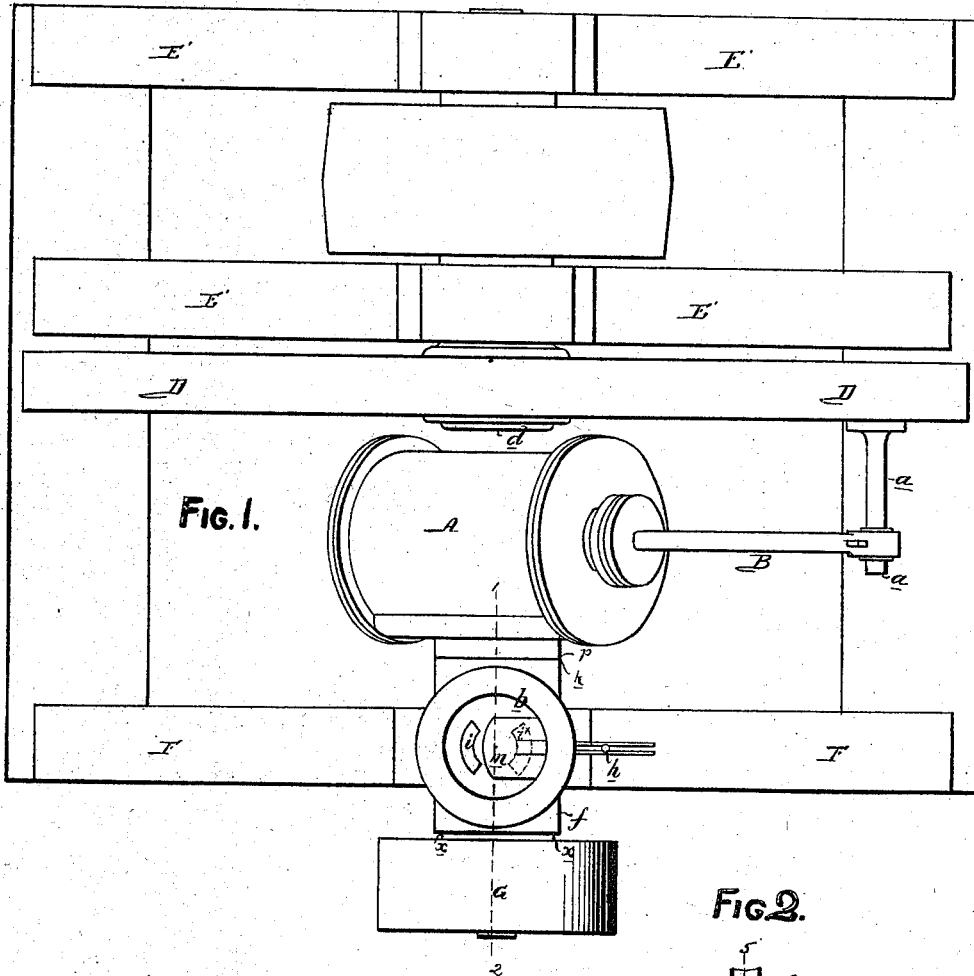


FIG. 2.

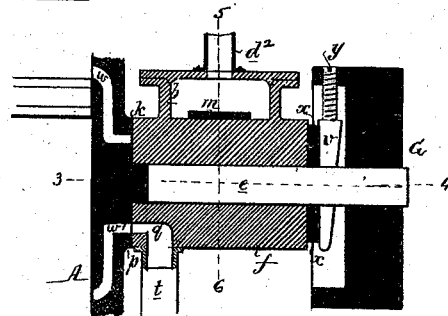
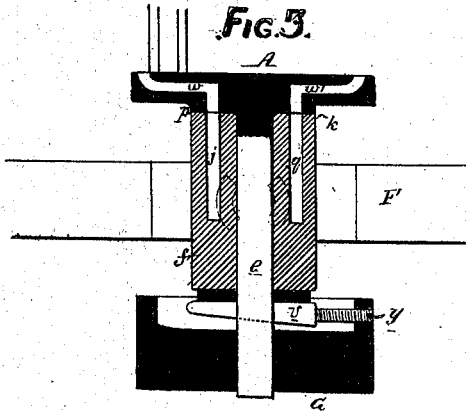


FIG. 3.



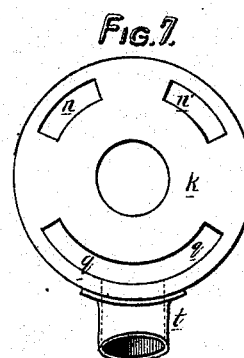
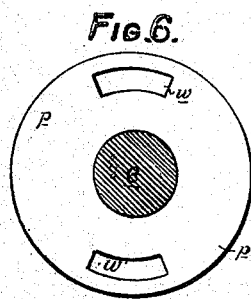
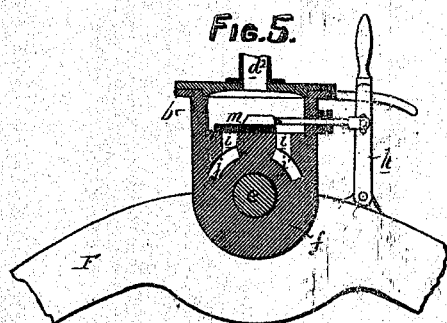
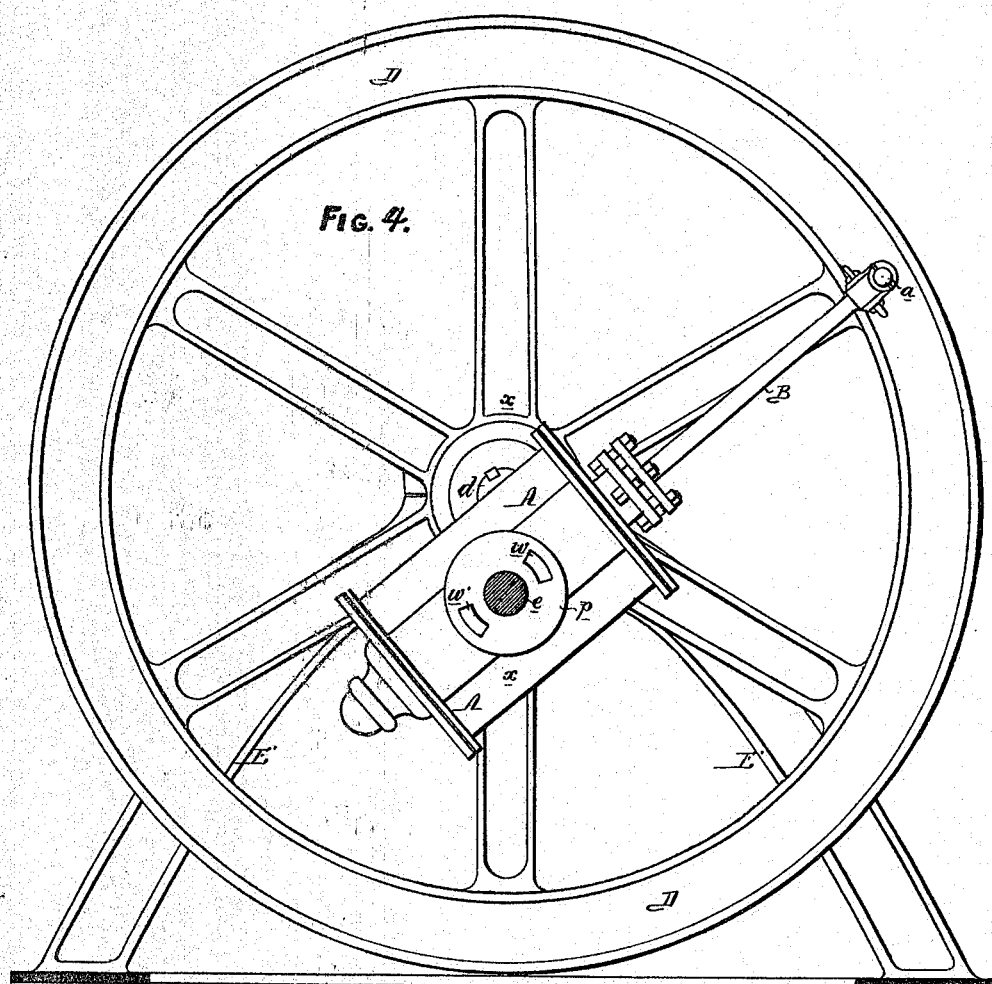
WITNESSES { *Wm. A. Steel.*  
*Jno. B. Harding.*

*Robert L. Cohen*  
*by his Atty.*  
*Stowson and Son*

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# United States Patent Office.

ROBERT LIVINGSTON COHEN, OF PHILADELPHIA, ASSIGNOR TO HIMSELF AND WILLIAM L. LANCE, OF PLYMOUTH, PENNSYLVANIA.

Letters Patent No. 112,688, dated March 14, 1871; antedated March 3, 1871.

## IMPROVEMENT IN ROTATING CYLINDER-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

I, ROBERT LIVINGSTON COHEN, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Rotary Cylinder-Engines, of which the following is a specification.

### *Nature and Object of the Invention.*

My invention relates to that class of engines in which a cylinder revolves on an axis eccentric with that on which the fly-wheel shaft revolves, and my invention consists of certain improvements, fully described hereafter, whereby the construction and operation of the engine are greatly simplified.

### *Description of the Accompanying Drawing.*

Figure 1, drawing No. 1, is a plan view of a rotary cylinder-engine with my improvements;

Figure 2, a vertical section on the line 1-2, fig. 1;

Figure 3, a sectional plan on the line 3-4, fig. 2;

Figure 4, drawing No. 2, a side view of the engine with the front bearing and valve removed;

Figure 5, a vertical section on the line 5-6, fig. 2;

Figure 6, a face view of the rotating seat of the valve; and

Figure 7, a face view of the stationary valve.

### *General Description.*

A is the steam-cylinder of the engine, the piston-rod B of which is connected directly to a pin, a, on the rim of the fly-wheel D, the shaft d of the latter turning in suitable bearings on the standards E and E', the cylinder having a trunnion, e, turning in and projecting through the bearing f of the standard F.

The center of this trunnion is in the same vertical line as the center of the shaft d, and the distance between these centers is equal to half the stroke of the piston, the engine to which my improvements are applied being essentially a crank-engine, although the cylinder rotates with the fly-wheel shaft, but on an axis eccentric with that of the fly-wheel, the distance between the axis of the cylinder and that of the fly-wheel being equal to the length of the crank or lever through which the pressure of the steam is exerted to turn the shaft d.

On the bearing f of the cylinder's trunnion is a small chest, b, with which communicates the steam-pipe d'; the chest containing a valve, m, which may be adjusted by a lever, h, as shown in fig. 5, or by any other suitable appliances, so as to expose or cover one or other of the vertical ports i i' formed in the bearing f, or to close both ports.

The vertical port i communicates with a horizontal passage, j, and the port i' with the horizontal passage j', and these passages terminate in the ports

n and n' of the stationary valve-face k, formed by the end of the bearing f, in which face is also the exhaust-port g, communicating through a passage in the said bearing f with the exhaust-pipe t.

A circular face, p, concentric with the trunnion e, is formed on the steam-cylinder A midway or thereabout between the opposite ends of the same, and in this face are two ports w and w', one communicating with the interior of the cylinder on one side of the piston, and the other with the cylinder on the opposite side of the piston.

It is necessary that the face p on the cylinder should be maintained in steam-tight contact with the stationary valve-face k; this I accomplish by means of a taper-key, v, adapted to a slot in the trunnion e, and bearing against a washer, x, which fits snugly against the outer end of the bearing f, this key being held in place and rendered so adjustable, by a set-screw, y, that by a slight turn of the latter the face p of the cylinder can be brought to bear in such close contact with that of the stationary valve as to insure a tight-joint without causing sufficient friction to detract from the power of the engine.

When the engine is in operation steam passes to the cylinder through one only of the ports n and n', the other port being closed by the adjustment of the valve m, and these two ports are so arranged, in respect to each other and to the ports in the face p of the cylinder, that when the steam has a free passage through one port the cylinder with the fly-wheel will revolve in one direction, but in a contrary direction when the steam passes through the other port; the movement of the engine can consequently be reversed by the simple adjustment of the valve.

When an engine is required to turn a shaft in one direction only, one of the ports n or n' and its passage, and consequently the valve m, may be dispensed with.

The ports n and n' are also so arranged in respect to those of the cylinder that steam is admitted to the latter during a portion only of the stroke, no matter which of the said ports n or n' the steam passes through; the exhaust-port g, however, is so arranged as to afford a free passage of the steam from the cylinder during an entire stroke.

Engines with rotary cylinders have long been known, but although simple and cheap in construction, and occupying comparatively little space, they have been for the most part discarded by practical engineers, owing, it is believed, to the imperfect valve appliances with which they have been hitherto furnished, and to the want of simple devices for reversing.

Practical tests have proved that, by the above-described valve system and arrangement of steam and

exhaust-passages, engines of this class may be made of practical value and serve all the purposes of more expensive and cumbersome engines.

*Claims.*

1. In a rotary engine, consisting of a cylinder supported in a trunnion eccentric to the shaft of a fly-wheel, to a pin on which the piston-rod is connected, the combination of ports *vw* in the face of the cylinder with a steam-port *n* and exhaust-port *g* in the bearing, when the said ports are arranged as described.

2. The slotted trunnion *e* and bearing *f*, in combination with the washer *x*, key *z*, set-screw *y*, and pulley *G*, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT LIVINGSTON COHEN.

Witnesses:

HARRY SMITH,

WM. A. STEEL.