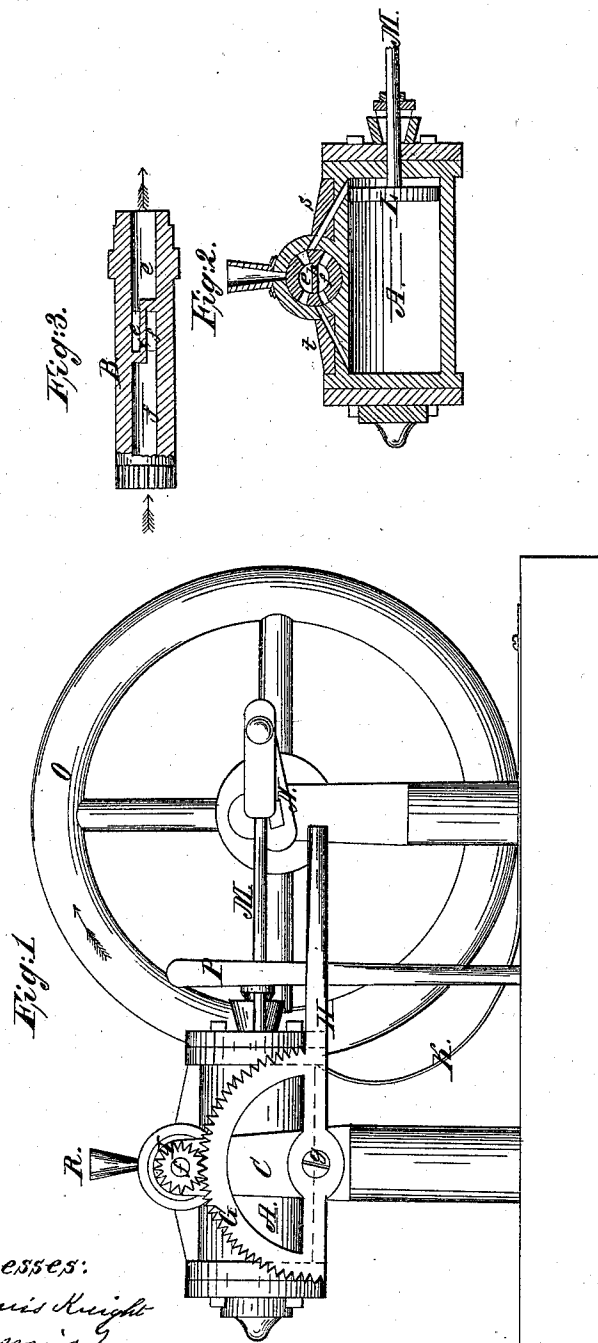


M. E. BOLLINGER.
OSCILLATING ENGINE.

No. 31,775.

Patented Mar. 26, 1861.



Witnesses:
Oscaris Knight
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attys

UNITED STATES PATENT OFFICE.

MARTIN ELI BOLLINGER, OF LITTLESTOWN, PENNSYLVANIA.

OSCILLATING ENGINE.

Specification of Letters Patent No. 31,775, dated March 26, 1861.

To all whom it may concern:

Be it known that I, MARTIN ELI BOLLINGER, of Littlestown, in the county of Adams and State of Pennsylvania, have invented certain new and useful Improvements in Oscillating Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of an engine embodying my improvements. Fig. 2 is a vertical longitudinal section of the cylinder. Fig. 3 is a vertical longitudinal section of the trunnion.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists, 1st, in a novel manner of hanging an oscillating cylinder; 2d, in a novel construction of trunnion and valves; 3rd, in a device serving the combined purposes of stopping and starting reversing and cut off gear; 4th, in the use of a spring or other device to equalize the motion of the cylinder as hereinafter explained.

A represents a cylinder suspended from its upper side by a single trunnion B running completely across and journaled at its respective ends in standards C. The said trunnion is suitably packed for the cylinder to turn upon it and performs the functions of supply and exhaust valves, being perforated centrally and formed with a partition b, separating the induction port *f*, from the exhaust port *e*.

G, is a toothed segment pivoted at its center *g*, to one of the standards C, and provided with a handle or lever H, by which it is turned when requisite.

I, is a pinion secured to the trunnion B and meshing with the segment G.

K, is a spring operating to receive the momentum of the cylinder and assist in its return stroke. The said spring may be of steel, gum elastic or other material.

L, is the piston; M, the piston rod; N, a crank; O, a fly wheel and R, an oil cup.

The drawing represents the engine on the "dead center" the piston being at one end of its stroke. The continued rotation of the

fly-wheel in the direction indicated by the arrow, by depressing the forward end of the cylinder brings the port *s*, into communication with the induction port *f*, and the port *t*, with the exhaust port *e*, producing the backward stroke of the piston, after the completion of which the reverse motion of the cylinder brings the port *t*, into communication with the induction and the port *s*, with the exhaust, thereby imparting the customary continuous rotation to the crank N.

It will be understood from the foregoing description that the trunnion B, is stationary while the engine is in continuous motion. By rotating the trunnion 90 degrees, by means of the segment the ports will be thrown entirely out of connection and the engine thereby stopped, and by rotating it 180 degrees the motion will be reversed.

By a less motion of the trunnion the engine may be made to cut off at any part of the stroke desired so as to work the steam expansively. It will thus be seen that the trunnion B, and segment G, as constructed and arranged constitute a combined starting and stopping, reversing and cut off gear of simple and effective character. A scale may be marked upon the post P, to assist in setting the handle H at any proper point.

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

1. Suspending an oscillating cylinder by a single shaft or trunnion on its upper side as set forth.

2. The trunnion or hollow shaft B, containing at its respective ends the induction port *f*, and the exhaust port *e*, and applied to the cylinder A, in the manner and for the purposes set forth.

3. The combination of the segment rack G, with the pinion I, for rotating the trunnion B, in the manner and for the purposes explained.

4. The spring K, or its described equivalent applied to the cylinder A, to equalize its motion, as set forth.

MARTIN E. BOLLINGER.

Witnesses:

GEO. WILL,
JACOB STERMER,
JACOB M. BOLLINGER.