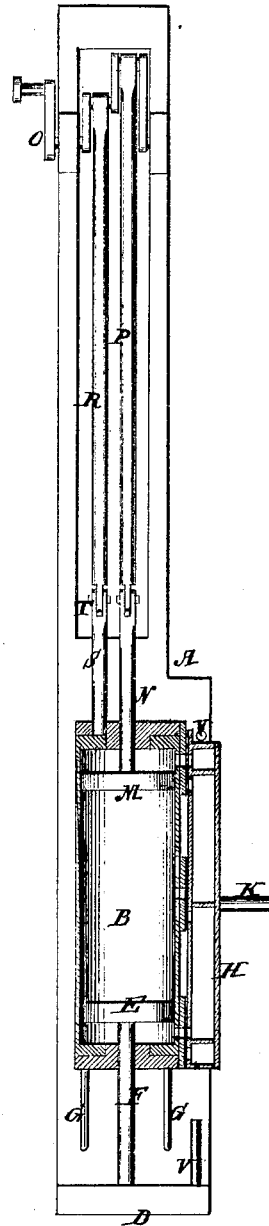


*Patented Feb. 28. 1871.*

*Fig. 2*



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# UNITED STATES PATENT OFFICE.

POWELL F. NICKERSON, OF SMYRNA, DELAWARE.

## IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **112,170**, dated February 28, 1871.

*To all whom it may concern:*

Be it known that I, POWELL F. NICKERSON, of Smyrna, in the county of Kent and State of Delaware, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

This invention relates to a new and useful improvement in steam-engines; and consists in the construction and arrangement of parts hereinafter described.

In the accompanying drawing, Figure 1 represents a longitudinal side view of an engine constructed according to my invention. Fig. 2 is a top or plan view.

Similar letters of reference indicate corresponding parts.

A is the bed-plate. B is the cylinder. C is the rod, supported from the end piece, D, of the bed-plate, with a stationary head or abutment, E, upon its inner end. The rear head, F, of the cylinder slides back and forth on this rod.

The principal novelty of this engine consists in the longitudinal movement of the cylinder at each stroke. The cylinder is supported in a horizontal position on ways or guides G G. More or less of these supporting-guides may be employed for keeping the cylinder in its proper place.

H is the steam-chest attached to the cylinder, and partitioned off, so as to divide the live steam from the exhaust-steam, as seen in Fig. 1. I I I represent induction-ports, and J J J eduction or exhaust ports.

The steam-chest is made to move upon the face of the cylinder, so as to bring these ports to correspond with the ports of the cylinder.

K is the steam-pipe, and L the exhaust-pipe, connected with their respective chambers on

the steam-chest, as represented in the drawing. M is the main piston of the engine, which is, on the rod N, attached to the crank-shaft O by the connecting-rod P. The cylinder B is attached to the crank-shaft by the connecting-rod R, which is jointed to the rod S at T, the latter rod being rigidly attached to the cylinder.

When the moving piston is near the stationary head or piston E, steam enters between them and forces them apart, acting alike on the cylinder and the moving piston. At the same time the exhaust-ports at each end of the cylinder are opened. At the end of the stroke the rear end of the cylinder is near the stationary head E, and the piston M and the front end of the cylinder are near together. At this point the steam is exhausted from the central portion of the cylinder, and live steam is introduced into the ends. This latter position of the parts is plainly seen in Fig. 2.

This operation is constantly repeated, the steam-chest H being moved at the end of each stroke by means of stationary stops *v v*, to change the ports, as required, for receiving and exhausting the steam.

In consequence of the movement of the cylinder the piston E is allowed to travel twice the distance it would were the cylinder stationary. Consequently the crank is double the length and has a corresponding purchase on the shaft.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The cylinder B, stationary head E, moving piston M, and sliding steam-chest H, constructed and arranged to operate substantially as and for the purposes herein shown and described.

POWELL F. NICKERSON.

Witnesses:

J. W. MARINER,  
J. T. JENNAN.