



R. T. P. ALLEN.  
Steam Engines.

No. 142,660.

Patented September 9, 1873.

Fig. 3.

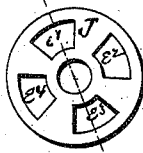


Fig. 4.

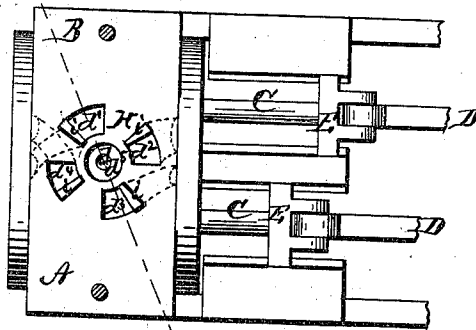
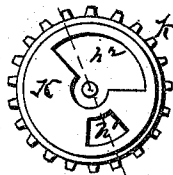


Fig. 5.



WITNESSES

Henry N. Miller

C. L. Everett

By

R. T. P. Allen INVENTOR  
per  
Duncan & Co. Attorneys.

# UNITED STATES PATENT OFFICE.

ROBERT T. P. ALLEN, OF FARMDALE, KENTUCKY.

## IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **142,660**, dated September 9, 1873; application filed July 17, 1873.

### *To all whom it may concern:*

Be it known that I, ROBERT T. P. ALLEN, of Farmdale, in the county of Franklin and in the State of Kentucky, have invented certain new and useful Improvements in Steam-Engines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a steam-engine having two cylinders, with their pistons, and a single valve and one main shaft, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a plan view of my engine and valve. Fig. 2 is a section through the valve and cylinders on the line *xy* of Figs. 3, 4, and 5. Fig. 3 is a plan view of the rotary cut-off. Fig. 4 is a plan view of the valve-seat, and Fig. 5 is a bottom view of the valve.

A and B represent two steam-cylinders, each having a piston and rod, C, attached to a cross-head, E, and this, by a pitman, D, connected with a crank, *a*, on the main shaft G. The two cranks *aa* on this shaft stand at right angles with each other; hence there is no dead-center, and no fly-wheel is needed. H represents the valve-seat, provided with four openings, *d*<sup>1</sup>, *d*<sup>2</sup>, *d*<sup>3</sup>, and *d*<sup>4</sup>, for steam. The openings *d*<sup>1</sup> and *d*<sup>3</sup> connect with the cylinder A, and the openings *d*<sup>2</sup> and *d*<sup>4</sup> with the cylinder B. *d*<sup>5</sup> is the exhaust, and *d* is the central socket at the bottom of the exhaust-port for the foot of the valve-spindle I. J represents the variable cut-off plate resting on the valve-seat H, and actuated by the governor. This cut-off is provided with steam-openings *e*<sup>1</sup>, *e*<sup>2</sup>, *e*<sup>3</sup>, and *e*<sup>4</sup>, corresponding with those in the valve-seat, but so much larger as to include or embrace the stops *i i*, which are formed on the valve-seat, one at one end of each opening in the same. K represents the valve, which is, in fact, a rotating steam-chest, with a central spindle, *f*, upon which the valve rotates, the lower end of said spindle resting in the socket *d* on the valve-seat,

and the upper end held by a suitable frame. *h* is the diaphragm in the valve K, separating the live steam from the exhaust, and forming the roof of the exhaust-dome. *h*<sup>1</sup> is the opening for the live steam, and *h*<sup>2</sup> the exhaust. On top of the valve is a cog-wheel, *k*, and this is, by suitable cog-gearing, connected with the main shaft G. L is the steam-inlet pipe, connected with the valve by a suitable stuffing-box. When the engine is in motion the valve is revolved by the cog-gearing, as shown. The engine may be reversed by making the connecting-rod *m* of the cog-gearing in two parts, connected by a sleeve, held in place by a straight groove in the end next the main shaft and a quarter spiral groove on the end next the valve, so that by slipping the sleeve forward the valve is thrown forward one-fourth of a revolution, and at the same time a plate in the bottom of the valve is moved so as to close the opening *h*<sup>1</sup> and open another port, thus reversing the valve; or the engine may be reversed without reversing the valve, which I prefer, by arranging the cog-gearing in the center of the frame instead of at the side, and introducing an additional wheel on the other side, so that this additional wheel will revolve freely on main shaft in direct motion, and be clutched when the engine is reversed.

It will be noticed that steam is so let on each cylinder that the one piston is always half a stroke behind the other. In placing the cog-gearing in the center, the cylinders A and B should be separated a few inches.

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

The combination of the cylinders A B, with their pistons connected with right-angled cranks on the main shaft G, the seat H, cut-off plate J, with its ports, and valve K, the cut-off plate being operated from the governor and the valve from the main shaft, all substantially as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of July, 1873.

R. T. P. ALLEN.

Witnesses:

JOHN C. JONES,  
A. H. OVERTON.