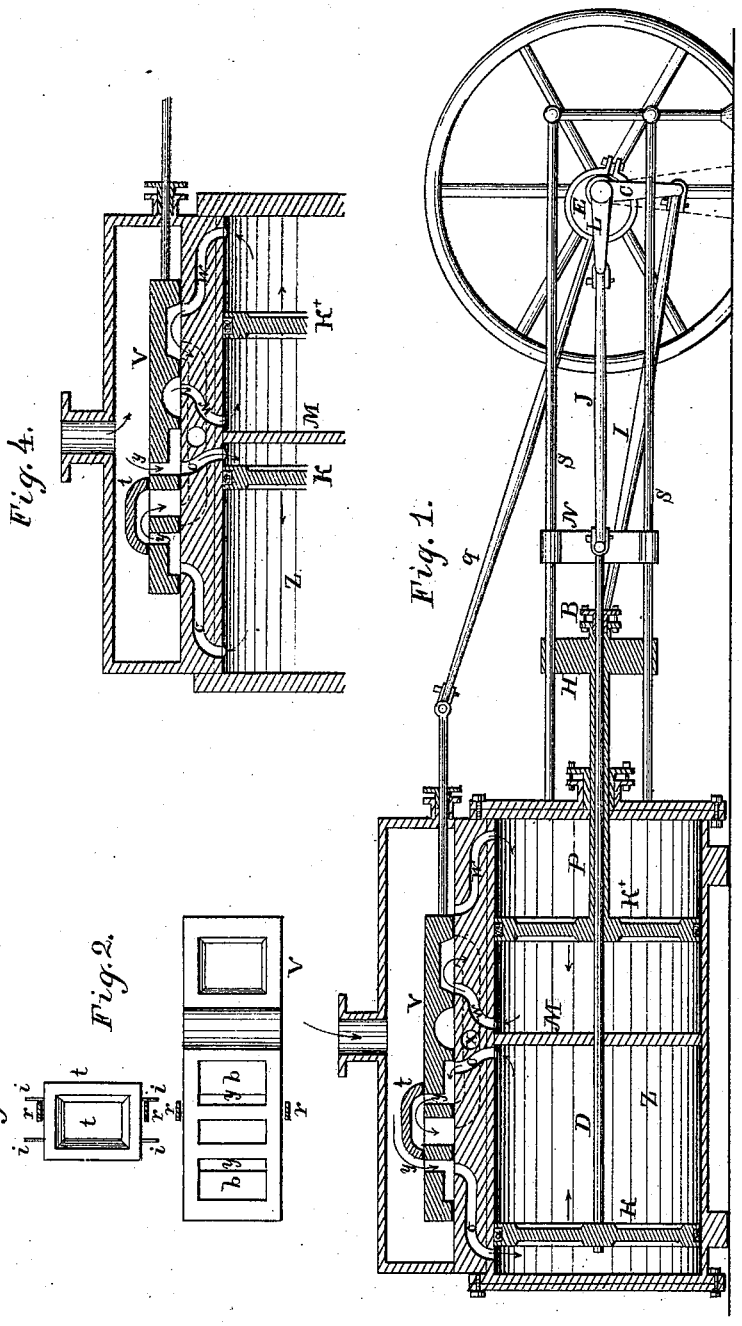
A. R. CRIHFIELD.

STEAM-ENGINE.

No. 181,315. Patented Aug. 22, 1876.




Witnesses:

John C. Hickee

Stephen Lloyd.

Inventor:

Aylett R. Crihfield.

# UNITED STATES PATENT OFFICE.

AYLETT R. CRIHFIELD, OF LINCOLN, ILLINOIS.

## IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **181,315**, dated August 22, 1876; application filed December 23, 1875.

*To all whom it may concern:*

Be it known that I, AYLETT R. CRIHFIELD, of the city of Lincoln, county of Logan, and State of Illinois, having invented certain Improvements in Steam-Engines, or engines to be operated by any elastic fluid under pressure, hereby declare the annexed specification to be a correct description of the same.

The object sought is to obtain the effective use or service of two cranks on one shaft by the use of one cylinder, thereby obviating the dead-centers.

In the annexed drawings, which are a part of this specification, I use like letters of reference for the same parts, as exhibited in the various figures or drawings.

Z, Figure 1, is a cylinder, cut away in order to show its internal parts. M is a head or partition, set inside of said cylinder to divide it into two parts. It is tightly packed, and made secure and solid. On each side of said stationary head or partition M I place a piston-head, K K$^{\times}$, and attached to each one is a piston-rod, D and P, respectively. The piston-rod P is hollow, and terminates at the cross-head H, attached to which is a stuffing-box, G, said cross-head being supported by the sliding bars S S. The piston-rod D, attached to the piston-head K, passes through a stuffing-box in the center of the head M, and passes into and through the hollow piston-rod P, the stuffing-box B, and terminates at, and is attached to, the cross-head N. The cross-head H carries a connection-rod, I, which is connected with a crank, C. The cross-head N carries a connection-rod, *j*, which is affixed to a crank, L, said cranks C and L being on one shaft, and set at right angles with each other.

On each side of the interior head or partition M portways are made to admit power, said portways being indicated by the letters *o o w w* into the cylinder to press upon the piston-heads K K$^{\times}$. The valve *v* is operated by the eccentric E working the valve-rod *q*.

Fig. 2 shows the under side of the valve *v*. *y y* are slots cut through the valve, and when lying in its place, as shown in Fig. 1, said slots move upon and over the portways *o o*, alternately opening and closing said ports.

The hollow parts of the valve (marked *b b*) connect with the slots *y y*, and while the valve is in motion the hollow parts *b b* will traverse over the portways *o o*, permitting steam or other elastic pressure to pass into the cylinder, and move the piston-head K and rod D to the end of the stroke of the crank L, when the suppleimentary valve *t*, Fig. 3, is, by means of the lugs *i i i i* working against the fixed points *r r*, made to cover the slots *y y*, in such manner that the hollow part thereof (marked *t*, Fig. 3) covers the portways, and permits the exhaust to pass up through the slot *h*, Fig. 2, and through the exhaust-opening at X, Fig. 1. The exhaust-ways for the ports *o o* and *w w* come together at X, Fig. 1. The portways *w w* are operated by that part of the valve *v* marked *t*, and which is the ordinary slide-valve.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the cylinder Z, the fixed head M, the piston-heads K K$^{\times}$, the hollow piston-rod P, and the piston-rod D the valve *v* and the supplementary valve *t*, operating together, for the uses and purposes described.

AYLETT R. CRIHFIELD.

Witnesses:

JOHN C. FICKER,

STEPHEN LLOYD.