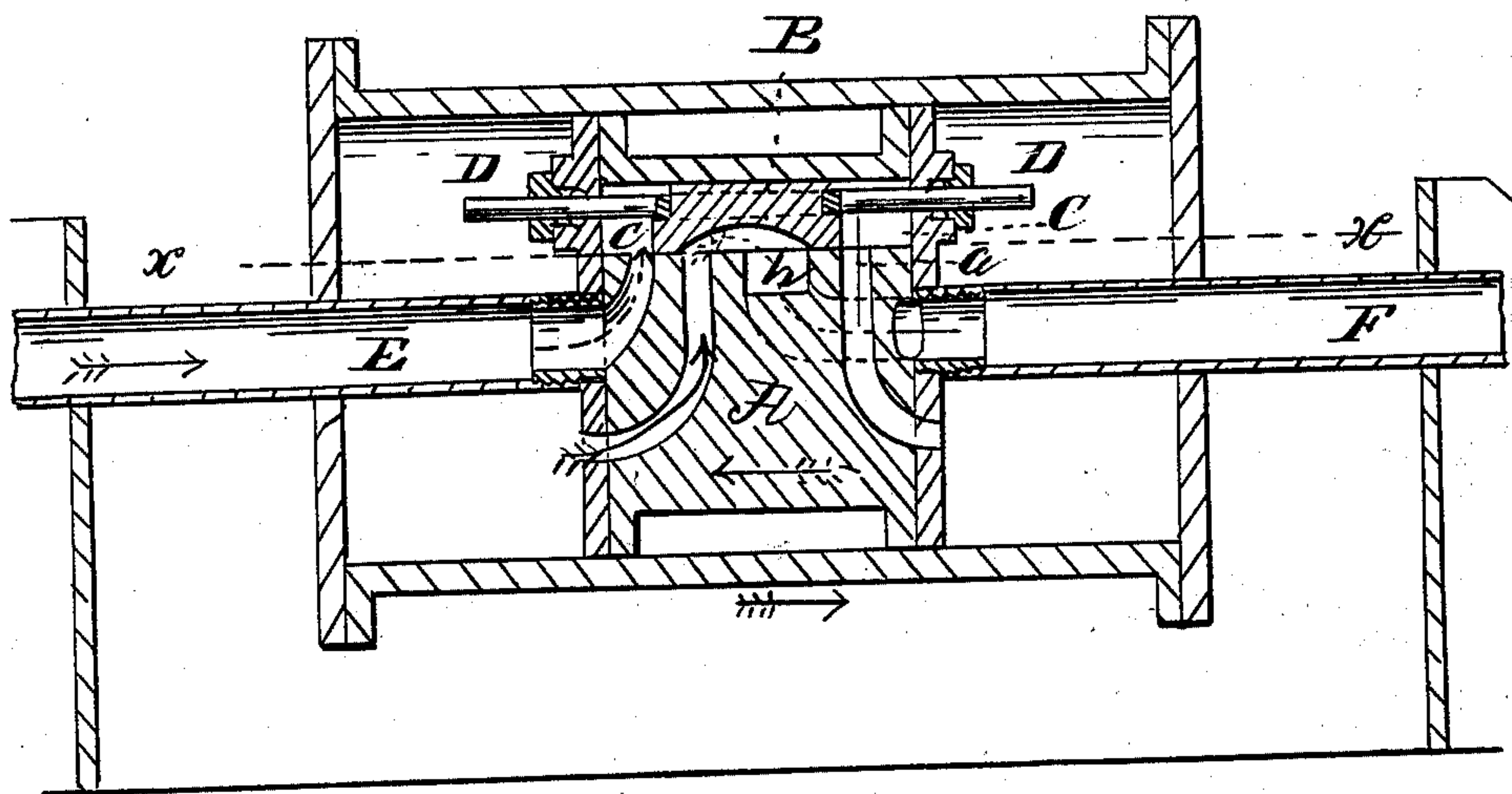
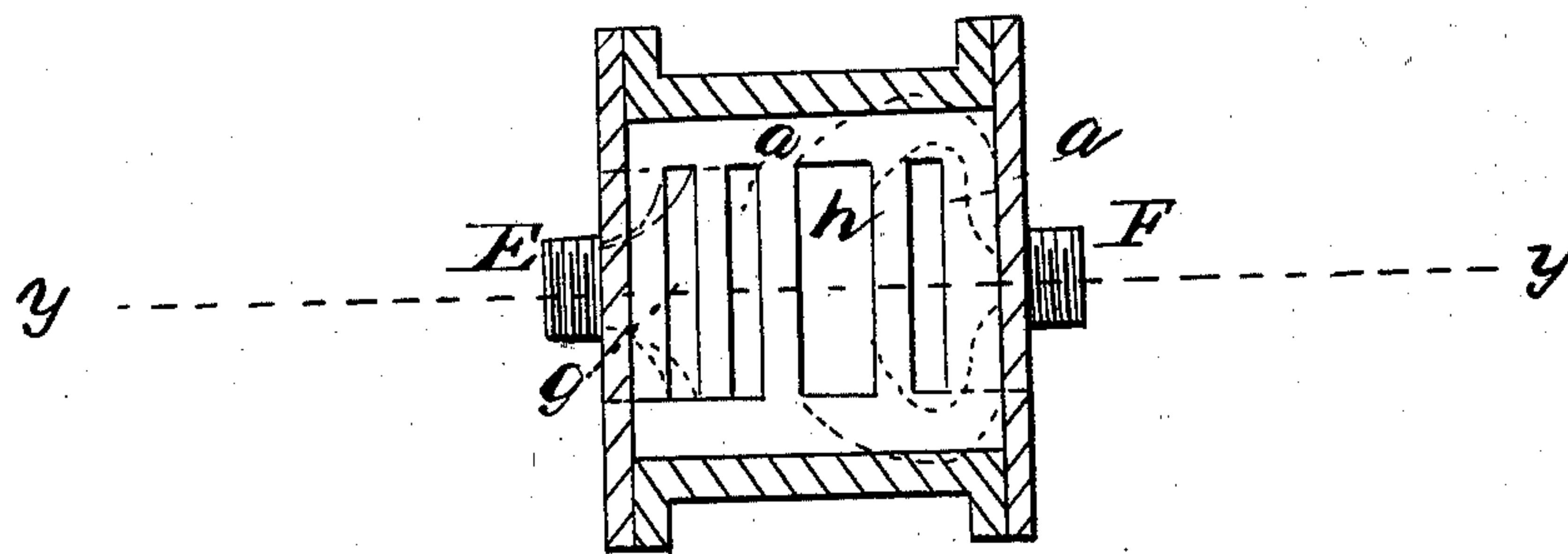


*J. Fairclough,*  
*Reciprocating Steam Engine.*  
*No 68,721, Patented Sep. 10, 1867.*

*Fig 1:*



*Fig. 2.*



*Witnesses:*

*Theo. Finsche.*  
*Wm. Freun.*

*Inventor:*

*John Fairclough.*  
*Per Mum & Co.*  
*Atty*

# United States Patent Office.

JOHN FAIRCLOUGH, OF ST. JOSEPH, MISSOURI.

*Letters Patent No. 68,721, dated September 10, 1867.*

## IMPROVEMENT IN STEAM ENGINES.

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

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN FAIRCLOUGH, of St. Joseph, in the county of Buchanan, and State of Missouri, 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 those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and improved method of admitting steam into a steam-engine cylinder and exhausting it therefrom; and it consists in forming in the piston of the cylinder the steam-chest, and in operating a slide-valve with steam and exhaust-ports therein, as will be hereinafter described.

Figure 1 represents a vertical section of the piston in a cylinder, (the cylinder being in red,) showing the slide-valve and the steam passages, the section being through the line *yy* of fig. 2.

Figure 2 is a section through the line *xx* of fig. 1, showing the face of the steam-chest with the steam-ports, &c.

Similar letters of reference indicate corresponding parts.

One important feature of this invention is the piston of the engine stands still while the cylinder moves, and thereby operates the slide-valve and imparts the motion to the machinery.

A represents the piston, which is packed against the interior surface of the cylinder in the usual manner. Within the piston the slide-valve marked B is operated. C is the steam-chamber. D is the valve-rod, each end of which extends through the piston, and is packed by stuffing-boxes, as seen in the drawing. E represents the piston-rod of the engine. It may be said that there are two piston-rods, E and F. Both of these rods are hollow, and both pass through the heads of the steam-cylinder. The rod E is the steam pipe and F is the exhaust pipe. *aa* represent the steam-ports in the chest C. As before stated, the piston and rods E and F are fixed. The cylinder slides back and forth on the rods at every stroke of the engine, and the valve B is operated thereby. The heads of the cylinder strike the valve-rod D, which moves the valve and admits or shuts off steam as the case may be. The course of the steam is indicated by arrows. As represented in the drawing, the cylinder is exhausting steam from the left hand and taking steam on the right. The part marked *g* represents the steam pipe from the boiler; *h* is the exhaust-port. It will thus be seen that all the ports and the whole valve apparatus of the engine are confined to the piston, and are consequently entirely concealed within the cylinder, thus dispensing with all eccentrics and greatly simplifying the construction of steam engines.

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

1. The valve B, constructed as described, and operated by means of the cylinder-heads through the rods D, as herein set forth for the purpose specified.
2. The steam-chest C and the steam and exhaust-ports *aa* and *h*, within the piston, substantially as described.
3. The piston A, having the slide-valve, steam-chest, and steam-ports arranged within it substantially as described, in combination with a steam-cylinder, substantially as and for the purposes set forth.

JOHN FAIRCLOUGH.

Witnesses:

JOHN M. FRAZER,

R. KAUF.