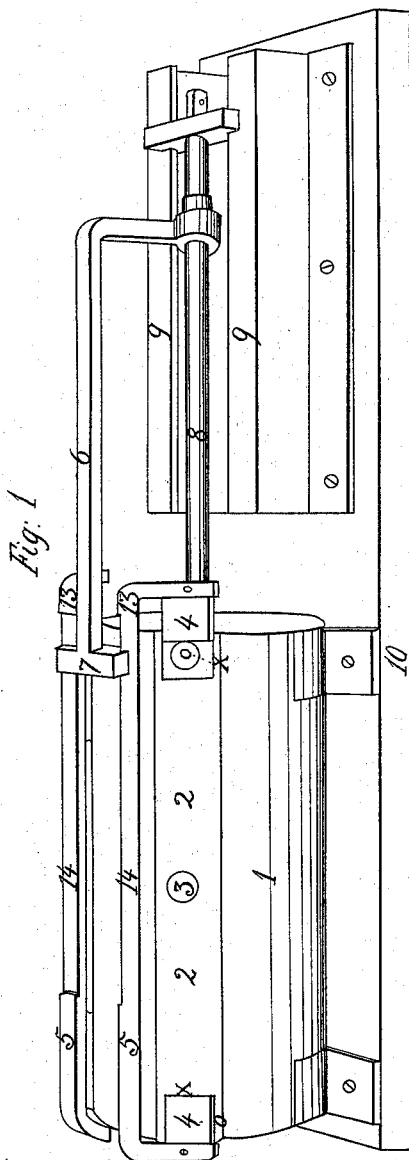
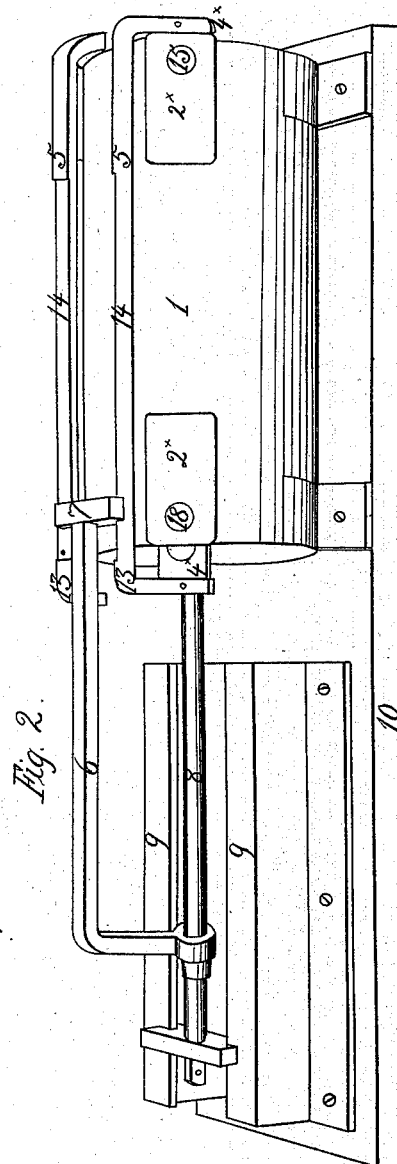


*C. E. Gage,*  
*Steam-Engine Valve-Gear.*  
*N<sup>o</sup> 47,492.                      Patented Apr 25, 1865.*



*Witnesses;*  
*Abraham Pyar*  
*Colum W. Dool*



*Inventor*  
*Chapman & Gage*

# UNITED STATES PATENT OFFICE.

CHAPMAN E. GAGE, OF WINONA, MINNESOTA, ASSIGNOR TO COLUMBIA  
DREW, OF SAME PLACE.

## IMPROVEMENT IN VALVE-GEAR FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 47,492, dated April 25, 1865.

*To all whom it may concern:*

Be it known that I, CHAPMAN E. GAGE, of the city and county of Winona, in the State of Minnesota, have invented a new and useful Improvement in Cut-Offs for Steam-Engines; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a steam-cylinder and appurtenances including my improved cut-off. Fig. 2 is a similar view taken from the opposite side.

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

This invention relates to an apparatus for regulating the supply and exhaust of steam in the cylinders of steam-engines; and it consists in adapting the yokes or valve-rods to constitute supports and guides for the reciprocating bar or cross-head, which receives motion from the piston rod and acts to open and close the proper induction and exhaust ports at each stroke, as will be hereinafter explained.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, 1 represents the steam-cylinder, and 2 the steam-chest, into which latter steam is conducted from the boiler through a pipe, whose end is received or inserted at the hole 3.

O X, Figure 1, represent the induction-ports, and 15, 18, Fig. 2, the exhaust-ports.

In Fig. 1, 4 4 represent the valves of the induction-ports O X, which valves are attached to the respective ends of one of the rods 14 and guided during their movement in suitable apertures in the ends of the steam chest 2.

4<sup>x</sup> 4<sup>x</sup> may represent the valves of the exhaust-ports, also attached to the ends of one of the rods 14 and guided in the boxes 2<sup>x</sup> 2<sup>x</sup>.

7 represents a bar placed transversely relatively to the cylinder 1, and joined to a crooked arm, 6, which is connected to and moves with the piston-rod 8. As the piston is driven back and forth in the cylinder, the bar 7 undergoes a corresponding movement and slides upon the valve rods 14 14. Near one end the latter are formed with shoulders 5 5, and near the other end with shoulders 13 13. The bar 7 in its reciprocating movement comes in contact with the shoulders 5 and 13 alternately. The valves 4 4<sup>x</sup> are so constructed and arranged that the movement which the valve rods 14 14 receive when the bar 7 is moving in contact with the shoulders 5 will cause said valves to assume such positions as to open the induction-port O and exhaust-port 18, and close the induction-port X and exhaust-port 15. On its return movement the bar 7 strikes the shoulders 13 on the valve-rods 14 14, and the latter with their valves are now moved in the opposite direction from that just spoken of, the result of which is the opening of the induction-port X and exhaust port 15 and closing of the induction-port O and exhaust-port 18. The cross-head of the piston-rod 8 works on guideways 9 9 in customary manner.

The above arrangement is simple and cheap in construction and will be found very effective in practical operation.

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

The sliding-valve rods 14 14, constituting supports and guides for the bar 7, which imparts movement to the valve-rods by coming in contact with the shoulders 5 13, and thus effects the alternate opening and closing of the proper induction and exhaust ports.

CHAPMAN E. GAGE.

Witnesses:

M. I. BUNDY,  
RICHARD G. CHAPPEL.