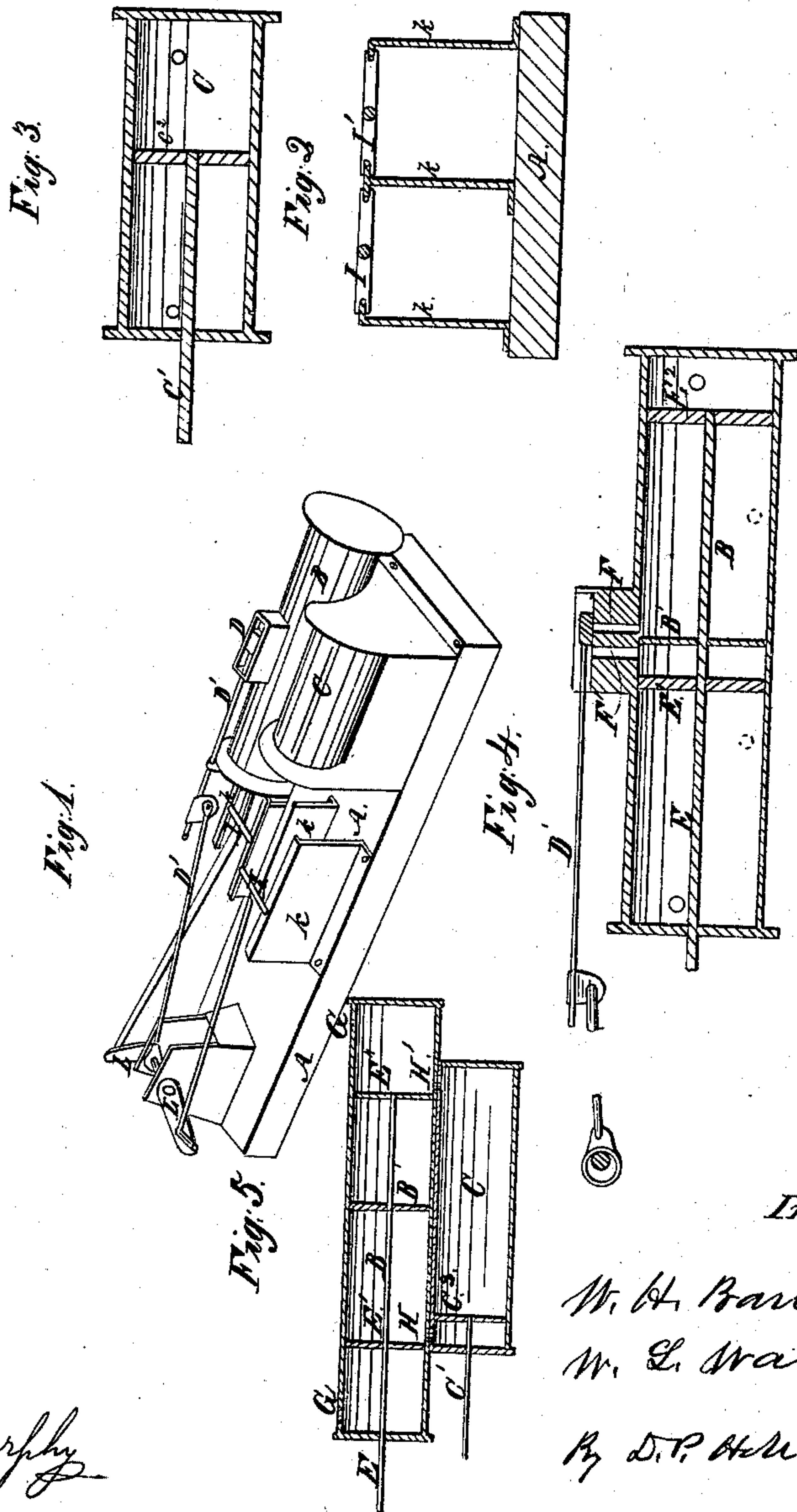


W. H. BANCROFT & W. L. WARD.  
STEAM ENGINE.

No. 68,938.

Patented Sept. 17, 1867.



Witnesses:

Chas. H. Hansen

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Attys.

# United States Patent Office.

WILLIAM H. BANCROFT AND WILLIAM L. WARD, OF PORTLAND, WISCONSIN.

*Letters Patent No. 68,938, dated September 17, 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 we, WILLIAM H. BANCROFT and WILLIAM L. WARD, of Portland, in the county of Dodge, and State of Wisconsin, have invented a new and useful Improvement in Steam Engines; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view.

Figure 2 is a cross-section of the ways and cross-heads

Figure 3 is a longitudinal section of the main cylinder.

Figure 4 is a vertical longitudinal section of the first cylinder.

Figure 5 is a horizontal section of both cylinders.

The same letters are employed in the designation of identical parts in all the figures.

A represents the shears, of suitable arrangement to support the mechanism of the engine, on which rest the two cylinders B and C. The cylinder B we denominate the first cylinder, which receives the steam and performs the function of an ordinary cylinder, and also, in combination with the piston, acting as a cut-off. The second cylinder C we will denominate the main cylinder. The first cylinder is divided into equal compartments by a partition, B<sup>1</sup>. We place over the centre any proper valve, D, operated by the rods D<sup>1</sup> attached to an eccentric on the shaft in the usual manner. E is the piston-rod of the first cylinder, which passes through the cylinder-head and through the partition B<sup>1</sup>. It has attached to it the piston-heads E<sup>1</sup> and E<sup>2</sup> in the respective compartments. Steam is admitted to these compartments through the ports F and F<sup>1</sup> placed on each side of the partition B<sup>1</sup>, and it escapes through the exit ports G G in the opposite ends of the compartments. The cylinders are connected by open ports, at H H, at the ends of the main cylinder, on opposite sides of the piston-head C<sup>2</sup>. The piston-rods are respectively connected with the cross-heads I I<sup>1</sup> running upon parallel ways K K, and these are connected, by ordinary connecting-rods, with the arms L and L<sup>1</sup> of a double crank, set at right angles to one another on the ends of the main shaft.

The operation of this engine is as follows: The piston-heads being as shown in fig. 4, steam will enter through the port F<sup>1</sup> and drive forward the piston-head E<sup>1</sup>. When the piston-head has passed the port H the steam will rush into the main cylinder C, behind the piston-head C<sup>2</sup>, and drive it in a direction opposite to that traversed by the piston-head E<sup>1</sup>. When the latter has reached the end of the cylinder the steam will be admitted through the port F, in front of the piston-head E<sup>1</sup>, and drive both piston-heads in the opposite direction. The piston-heads will pass the ports H and H<sup>1</sup> at the same time, so that as soon as steam is admitted through the port H<sup>1</sup> the port H will be opened, and the exit of the steam from that side of the piston-head C<sup>2</sup> will be permitted.

What we claim as our invention, and desire to secure by Letters Patent, is—

The combination of the first cylinder B, having a central partition, B<sup>1</sup>, and the main cylinder C, with their respective pistons, said cylinders being constructed as to their ports, and arranged in relation to one another and to said pistons, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM H. BANCROFT,  
WILLIAM L. WARD.

Witnesses:

ABEL BANCROFT,  
GEORGE A. NELSON.