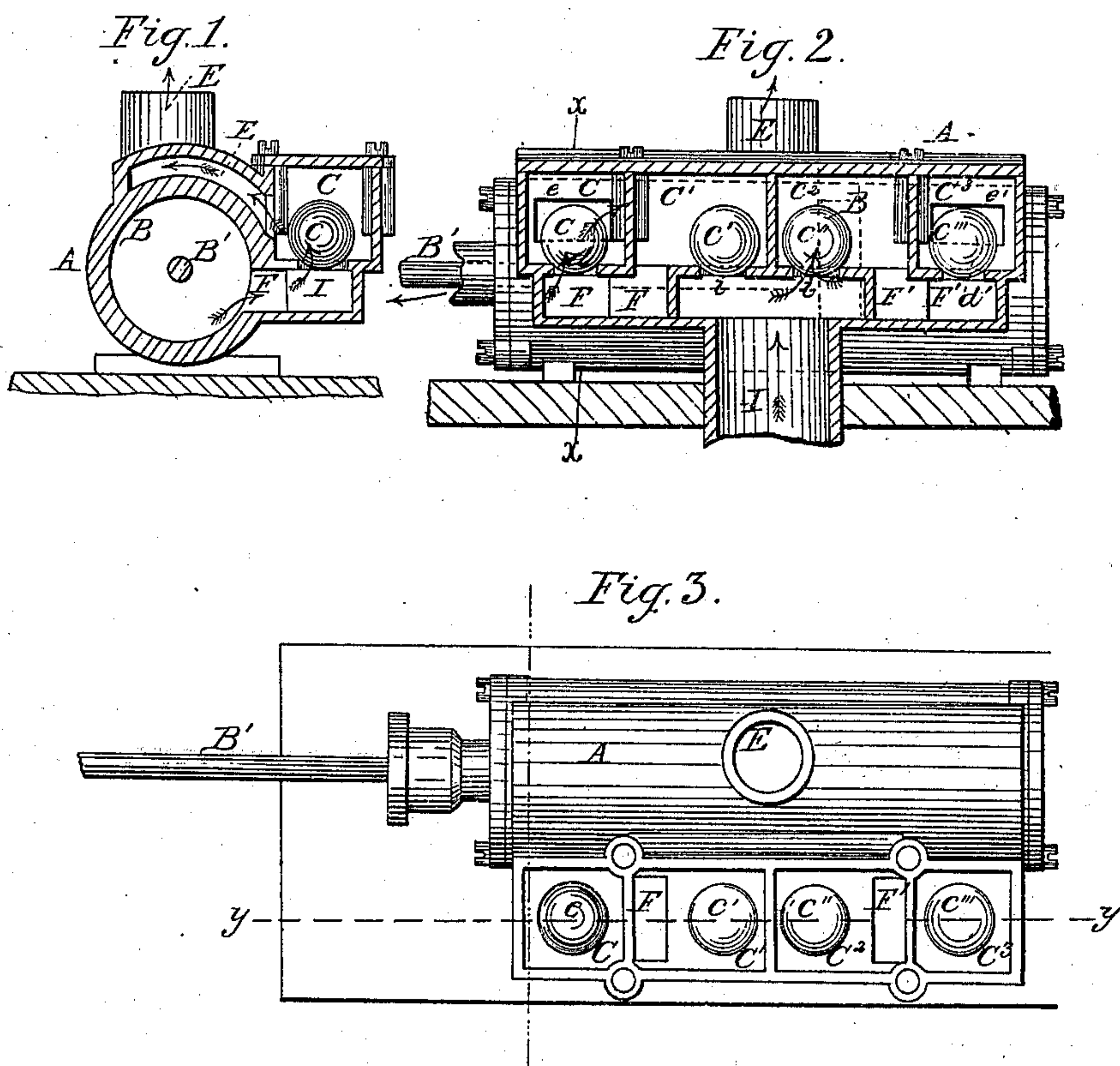


*R. W. Crouse,*  
*Steam Pump.*  
*N<sup>o</sup> 79,959.      Patented July 14, 1868.*



*Witnesses.*  
*E. H. Kennon*  
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# United States Patent Office.

RUFUS W. CROUSE, OF WESTMINSTER, MARYLAND.

Letters Patent No. 79,959, dated July 14, 1868.

## IMPROVEMENT IN PUMPS.

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, RUFUS W. CROUSE, of Westminster, in the county of Carroll, and State of Maryland, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a cross-section through the line  $xx$  of fig. 2.

Figure 2 is a longitudinal cross-section through the line  $yy$  of fig. 3.

Figure 3 is a side elevation, the near wall of the valve-chamber being removed.

This invention relates to the class of double-acting-cylinder pumps, and consists in a new and improved arrangement of the valves, by which power is economized, while the machine is rendered less complicated and less liable to get out of order.

In the drawings, A represents the cylinder; B, the plunger or piston; B', the piston-rod; I, the induction, and E the eduction-pipes of my pump.

In a chamber alongside of the cylinder A, corresponding to the steam-chest of a steam-engine, four apartments, C C<sup>1</sup> C<sup>2</sup> C<sup>3</sup>, are arranged in a straight line, the two end ones communicating directly with the eduction-pipe through the open ports  $e e'$ , the two centre ones communicating with the induction-pipe through the valve-ports  $i i'$ , each centre apartment communicating directly with the end of the cylinder nearest to it through the open passage F, which is tapped under the centre of the end apartment below which it runs, and at that point communicates with such end apartment through a valve-port,  $d d'$ .

All the water, therefore, that passes from the induction-pipe to the right-hand end of the cylinder, must pass through the right-hand centre apartment C<sup>2</sup>, and all that passes to the other end of the cylinder must pass through the left-hand centre apartment C<sup>1</sup>, while all the water that passes from the right-hand end of the cylinder to the eduction-pipe must pass through the right-hand end apartment C<sup>3</sup>, and all that passes to the eduction from the other end of the cylinder must pass through the left-hand end apartment C.

Having thus premised, I will proceed to describe particularly the operation of this improved pump, first remarking that all four of the valves,  $d d' i i'$ , seat downward, and that I prefer ball-valves to any other for this purpose.

To understand the operation of this pump, let us suppose the plunger B in the position shown in dotted lines in fig. 2, and moving to the left. In this case the suction through the passage F' will seat valve  $e'''$ , and close the way to the eduction, while the same suction will raise valve  $e''$  and open the way to the induction, and the right-hand end of the cylinder will fill with water. The plunger, approaching the left-hand end of the cylinder, will force the water out of that end through the passage F, into the apartment C<sup>1</sup>, where, in attempting to escape into the induction-pipe, it will close the valve  $e'$ , and cut off its own escape in that direction. The current will then flow through the passage F, lift the valve  $e$ , and pass through apartment C to the eduction-pipe, where it will escape.

When the motion of the plunger is reversed, the action of the parts, as here described, will be reversed also.

This pump is simple in construction and operation, compact, and all its parts may be cast strong and durable, so that it will last for many years without getting out of order. It throws the water rapidly by direct action, and utilizes all the power employed to the fullest extent.

A pump of sufficient capacity for ordinary purposes can in this way be made to occupy but a few cubic inches, and the eduction-pipe may be made of any ordinary pipe or hose, taking up but a mere trifle of space.

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

The combination and arrangement of the cylinder A, plunger B, induction I, and eduction E, when connected by the apartments C C<sup>1</sup> C<sup>2</sup> C<sup>3</sup> and the passages F F', provided with the valves  $e e' e'' e'''$ , all the said parts being constructed, arranged, and operating together, substantially in the manner and for the purposes set forth.

To the above specification of my improvement I have signed my hand, this 31st day of January, 1868.

RUFUS W. CROUSE.

Witnesses:

E. F. REESE,

CHAS. A. PETTIT.