

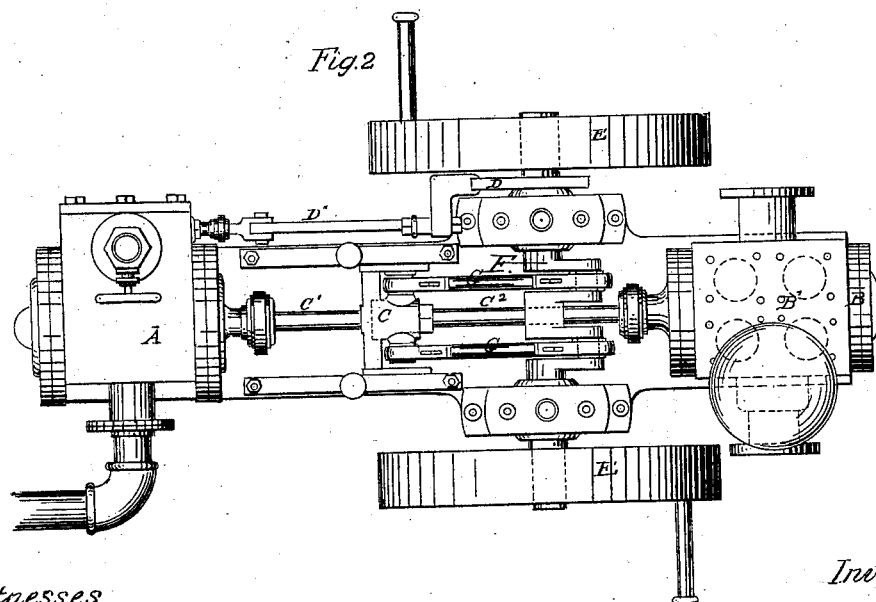
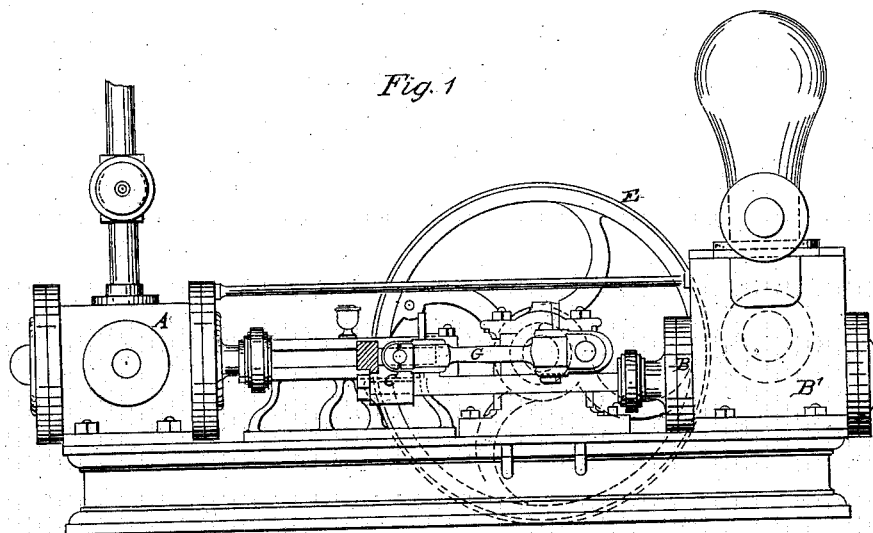
2 Sheets-Sheet 1.

L. W. Turrell,

Steam Pump.

N<sup>o</sup> 46,036.

Patented Jan. 24, 1865.



Witnesses  
J. W. Giesecke  
J. A. Nelson

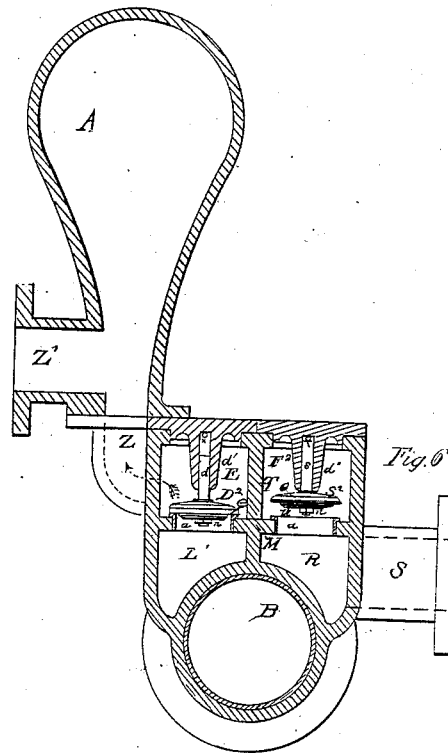
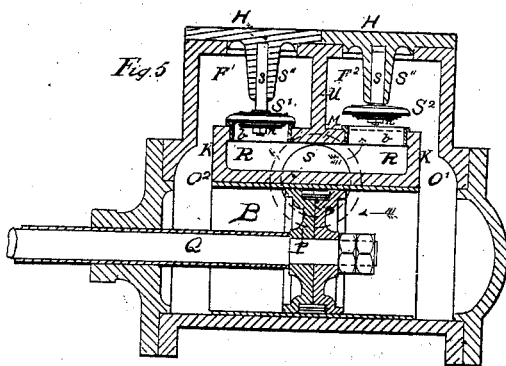
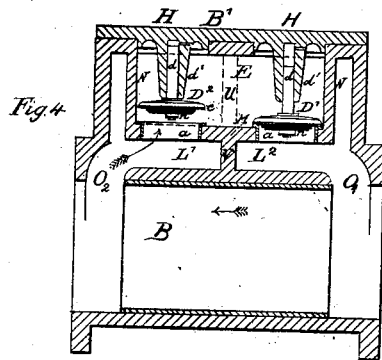
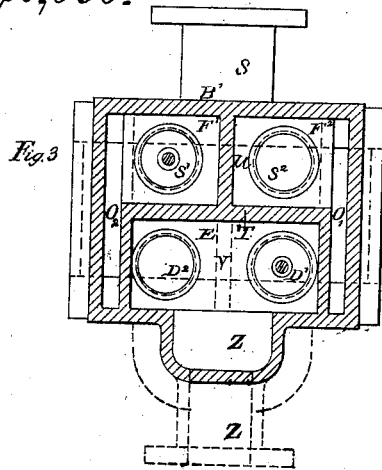
Inventor  
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2 Sheets-Sheet 2.  
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Steam Pump.

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Witnesses

T. W. Grecke  
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# UNITED STATES PATENT OFFICE.

LEVI W. TURRELL, OF NEWBURG, NEW YORK.

## IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 46,036, dated January 24, 1865.

*To all whom it may concern.*

Be it known that I, LEVI W. TURRELL, of Newburg, in the county of Orange and State of New York, have invented a new and useful Improvement in Steam-Pumps; 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 side elevation of a steam-engine embodying my invention. Fig. 2 is a plan of the same. Fig. 3 is a horizontal section of the valve-chamber of the feed-water apparatus. Fig. 4 is a vertical section of the feed apparatus, the plane of section being through the discharge-valves; and Fig. 5 is a similar view, the section being taken through the suction-valves. Fig. 6 is a transverse vertical section of the feed-water apparatus.

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

This invention consists in arranging both the suction and discharge valves of a steam-pump or feed-water apparatus upon a horizontal plate and guiding them by means of sockets projecting downward from the cap-plates; also, in a peculiar manner of arranging the several chambers employed in connection therewith. By thus arranging the valves they are rendered more easily accessible for repair or other purpose, as will be hereinafter fully 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, A represents the steam-cylinder, B the pump-cylinder, and B' the valve-chamber. The piston-rod C' of the steam-cylinder and the piston-rod C<sup>2</sup> of the pump-cylinder are connected to one and the same cross-head C. The shaft F, carrying the eccentric D and fly-wheels E E, is connected by the rods G G with the cross-head C. The eccentric D transmits motion to the shaft D'', whereby the valves of the cylinder A are operated, and the fly-wheels E E may be provided with handles to permit a small pump to be worked by hand.

The valve-chest B' may be cast in one piece with the pump-cylinder B, and is by the vertical wall T divided into two longitudinal

apartments relatively to the length of the engine, one of said apartments containing the suction-valves S' S<sup>2</sup>, and the other the discharge-valves D' D<sup>2</sup>. All the valves have their seats *a* in a horizontal plate or partition, M, beneath which and between the same and the pump cylinder B is a chamber, R, and chambers L' L<sup>2</sup>, the chamber R being beneath the valves S' S<sup>2</sup>, and the two latter, L' L<sup>2</sup>, beneath the valves D' D<sup>2</sup>. The said chambers L' L<sup>2</sup> are separated from each other by an intervening wall, V, and the wall T extends down as far as the top of the pump-cylinder B, so as to prevent direct communication of the chambers L' L<sup>2</sup> with the chambers R. A vertical wall, V, serves to form a chamber, F', for the valve S', and a chamber, F<sup>2</sup>, for the valve S<sup>2</sup>. The chambers, F' F<sup>2</sup> and L' L<sup>2</sup> communicate with the interior of the pump-cylinder B through spaces O' O<sup>2</sup>. The apartment E, in which the valves D' D<sup>2</sup> work, is shut off from the spaces O' O<sup>2</sup> by walls N N, and the chamber R, beneath the valves S' S<sup>2</sup>, is shut off from said spaces by the walls K K.

The valves may be made of brass and bear upon their faces washers *e* of leather, which are secured in place by small disks *m* and nuts *n*; and the valves are guided by stems *d* *s*, working in sockets *d'* *s'*, cast on the covers which close the valve-chest, it being designed to employ four of said covers, in order that the corresponding valve of each may be readily accessible.

The nozzle Z communicates with chamber E, in which the discharge-valves D' D<sup>2</sup> work, and said nozzle leads into an air-vessel, A, and into the nozzle Z', through which the water is forced into the steam-boiler or elsewhere. P is the piston of the pump-cylinder B. Water is introduced into the valve-chamber at the nozzle S, which communicates directly with the chamber R.

The operation may be explained in the following manner:

When the piston B has moved to the position represented in Fig. 5 and in the direction indicated by the arrow, a vacuum is formed beneath the valve S<sup>2</sup>, and the water rushes into the chamber R, raises the valve S<sup>2</sup>, enters the chamber F<sup>2</sup>, passes thence into the space O', and thence into the cylinder B, filling the entire vacuum produced by the aforesaid movement of the piston P. At the same

time the water or air contained within the cylinder before the piston begins to move is forced into the space  $O^2$ , and thence into the chamber  $F'$  and  $L'$ , the effect of which is to hold down the valve  $S'$  and raise the valve  $D^2$ , the water being thus afforded an entrance to the chamber  $E$ , in which it holds down the valve  $D'$ , and from which it passes into the nozzles  $Z Z'$ . The reverse movement of the piston opens the valves  $S' D'$  and holds down the valves  $S^2 D^2$ , the water from the induction-nozzle  $S$  first entering the chamber  $R$ , as before, and then passing through the valve  $S$  into the chamber  $F$  and space  $O^2$  and chamber  $L'$ .

It may be here remarked that in the double-acting pumps heretofore devised the discharge-valves have been placed over or above the suction-valves in such a way as to necessitate the removal of the former to make the latter accessible. In my apparatus it is only necessary, in order to expose the valves, to remove the covers or sections composing the

top of the valve-chest  $B$ , and this may be done with facility.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of the valves  $D' D^2 S' S^2$ , seated upon a common plate,  $M$ , and guided by sockets  $d' s''$ , projecting downward from the cap-plates, all as herein described, to facilitate the inspection and removal and replacement of the valves.

2. In combination with the above, disposing the several chambers of the valve-chest in such a way that the movement of the piston of the pump-cylinder will alternately open two of the valves and close two in the manner and for the purpose explained.

LEVI W. TURRELL.

Witnesses:

J. W. GERECKE,  
JAMES NELSON.