J. W. PEARCE.

STEAM-PUMP.

No. 192,873. Patented July 10, 1877.

Fig. 1.

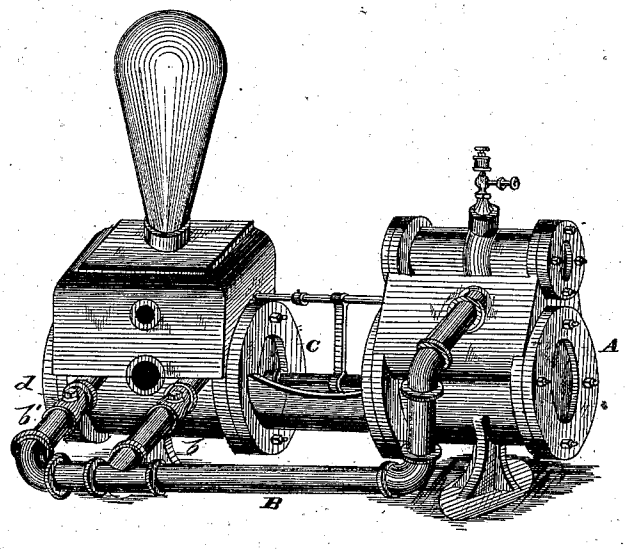
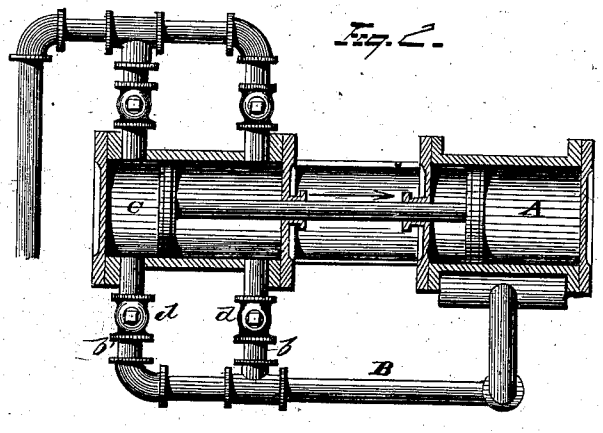


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES W. PEARCE, OF CLEVELAND, OHIO.

IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. **192,873**, dated July 10, 1877; application filed May 24, 1877.

To all whom it may concern:

Be it known that I, JAMES W. PEARCE, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Steam-Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to steam-pumps; and consists in connecting the exhaust-pipe with both ends of the water or piston cylinder of the pump, by which means a vacuum can be formed in the steam-cylinder, which will increase the power of the pump, as will be hereinafter fully specified and claimed.

In the drawing, Figure 1 represents a perspective view of a steam-pump embodying my invention. Fig. 2 represents a longitudinal cross-section of my device.

In the drawing, A represents the steam-cylinder, which is connected in the ordinary well-known manner with the exhaust-pipe B. Said exhaust-pipe is connected with both ends of the water or pump cylinder C by means of the branch pipes *b b'*. Each of said branch pipes is provided with a check-valve, *d*, both opening in the same direction toward the water-cylinder C. The water-cylinder is, of course, connected with the suction-pipe and exit-pipe in the usual manner. The suction-pipe and inlets are represented in the drawing, but the exit-pipe is omitted.

The operation of the device is as follows: When steam is being exhausted from the steam-cylinder A, the piston moving in the direction of the arrow, as indicated in the drawing, it passes through the exhaust-pipe B and branch pipe *b'* into the water-cylinder C. As the piston moves in the direction of the arrow it creates a vacuum behind it in the water-cylinder, which operates to open the check-valve in the branch pipe *b'*, and causes the water to rush into the water-cylinder through the suction-pipe. As the exhaust steam passes into the water-cylinder through the pipe *b'* it comes in contact with the water that is in the same, and is immediately condensed, thereby creating a vacuum in said water-cylinder, which operates to assist the steam-power.

It is obvious that by introducing the exhaust steam into the water-cylinder, where it acts to create a vacuum, less power is required to accomplish a certain result than when said operation is omitted.

The exhaust steam ordinarily cannot exhaust from in front of the steam-cylinder through the diminished outlet as rapidly as the piston comes against it; and it therefore to a considerable extent cushions the piston, or acts as a back resistance against its forward motion; but by my device the steam that has been exhausted into the pump-cylinder has become condensed, and the vacuum caused thereby extends from the pump-cylinder back through the pipe into the steam-cylinder; and, therefore, while the vacuum assists the suction into the pump-cylinder, and to that extent takes the work from the pump-piston, it at the same time removes the resistance that formerly reacted against the head of the steam-piston.

The operation described takes place at each stroke of the piston, the exhaust steam entering the water-cylinder alternately through the branch pipes *b* and *b'*.

What I claim is—

The combination, in a steam-pump, of the exhaust-steam pipe, provided with branches leading to opposite ends of the water-cylinder and check-valves located in said branch pipes, to prevent the admission of water into the exhaust-pipe, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAS. W. PEARCE.

Witnesses:

FRANCIS TOUMEY,

W. E. DONNELLY.