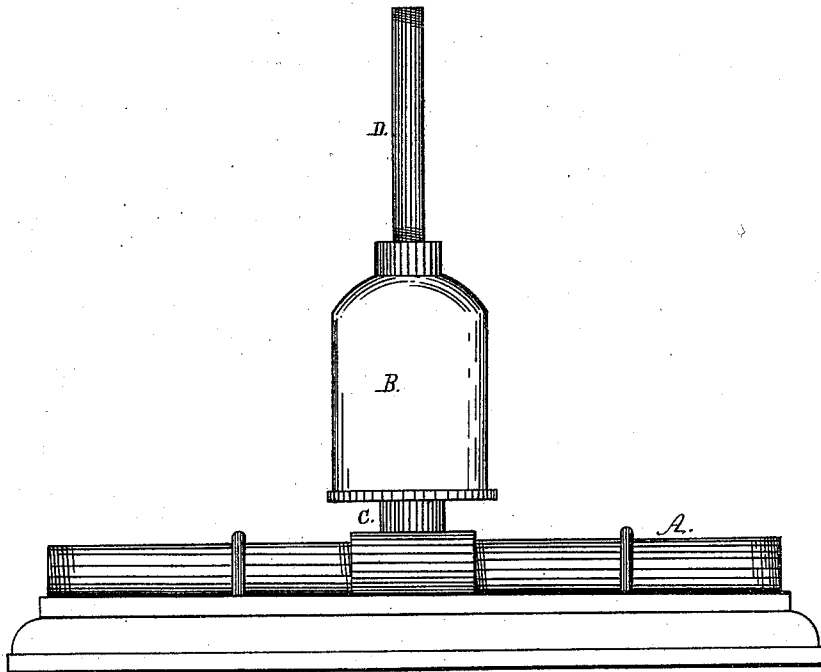


J. M. BAILEY.

SUPPLY-PIPES FOR STEAM-PUMPS.

No. 177,612.

Patented May 23, 1876.



WITNESSES.

*Reade W. Bailey*  
*James L. Johnston*

INVENTOR.

*James M. Bailey*

# UNITED STATES PATENT OFFICE.

JAMES M. BAILEY, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN SUPPLY-PIPES FOR STEAM-PUMPS.

Specification forming part of Letters Patent No. **177,612**, dated May 23, 1876; application filed April 5, 1875.

*To all whom it may concern:*

Be it known that I, JAMES M. BAILEY, of the city of Pittsburg, county of Allegheny, in the State of Pennsylvania, have invented certain Improvements in Supply or Suction Pipes for Pumps, of which the following is a specification:

This invention relates to certain improvements in the ordinary supply or suction pipes commonly attached to the barrel or cylinder of the ordinary lifting-pump; and it consists in connecting to such pipe a vacuum-chamber in which the exhaust steam of the engine is received and condensed, and in which, partly by the action of the pump and partly by the condensation of the steam, a partial vacuum is maintained, said vacuum holding the water in the pipe as high as the chamber, and keeping it flowing upward toward the pump-barrel, so as to be in readiness to be drawn into the barrel, thus relieving the pump from the jarring and straining to which it is ordinarily subjected by the water falling back in the suction-pipe. In addition to this, the exhaust steam is conveyed away and prevented from escaping into the mines, where this device is more especially designed to be used.

In the accompanying drawing, forming part of this specification, A represents an ordinary supply or suction pipe, which is designed to be attached to an ordinary lifting-pump, and to lead to the water-reservoir. B is the vacuum-chamber, attached to the suction-pipe by means of the short contracted pipe C. To the upper end of the chamber B is attached a pipe, D, which leads to the engine, and serves to convey the exhaust steam to the vacuum-chamber.

The operation of the improvement is as follows: The exhaustion of the air in the suction-pipe by the action of the pump causes a partial vacuum in the chamber B, which is filled by the water when it rises in the pipe to the height of the chamber. The pressure of the atmosphere holds the water in the chamber B so long as the air is exhausted from it, and, as it is placed as near to the juncture of the suction-pipe and pump-cylinder as it is possible to get it, it is evident that the pump

has a head of water constantly to act upon in close proximity to the lower valve of the cylinder, and thus the jarring and straining to which the pump is ordinarily subjected on account of the water falling back in the pipe and leaving a space in the pipe between the piston and the water filled with air, is obviated. If, however, air should get below the piston by leakage or other means, or the condensed air should be forced in the chamber B, and, by its expansion, tend to expel the water therefrom, it is obvious that the limited capacity of the connecting-pipe, in proportion to the amount of water held in the chamber, would prevent the water from running out of the chamber in the short interval between the strokes of the piston.

The same difficulty might obtain upon the entrance of the exhaust steam into the chamber, if it were not for the pipe C.

On the entrance of the steam the first tendency would be to expel the water from the chamber, but before this could be done through the small pipe the expansive force of the steam would be destroyed by its condensation, which would also enlarge the vacuum to be filled with water.

I do not claim, broadly, the application of a condensing-chamber to any supply-pipe, my invention being limited to the combination of such a chamber with the supply or suction pipe commonly used in connection with the ordinary lifting-pump.

I claim—

The chamber B, provided with the pipe C and pipe D, for conveying the exhaust steam from the engine, in combination with the ordinary suction-pipe, whereby the water in the suction is kept in motion and maintained at a high level near the pump-cylinder by the vacuum in the chamber D, produced by the action of the pump-piston and the condensation of the steam, substantially as described, and for the purpose set forth.

JAMES M. BAILEY.

Witnesses:

READE W. BAILEY,  
JAMES J. JOHNSTON.