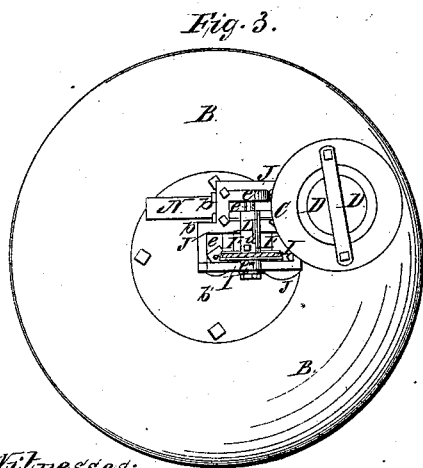
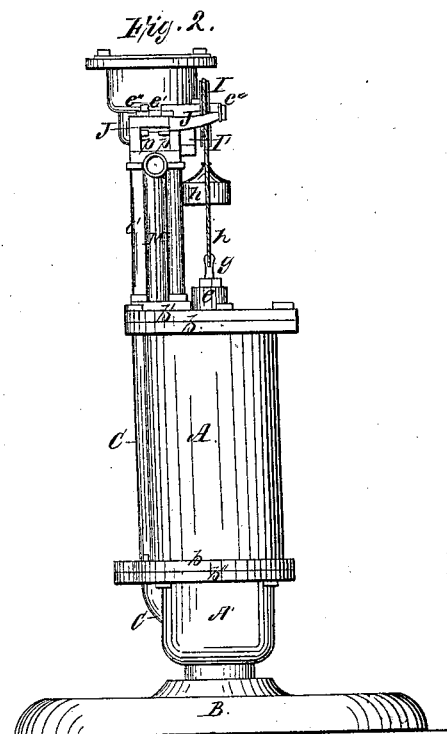
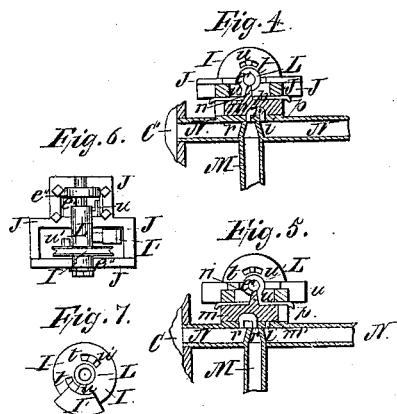


*Patented Mar. 13, 1866.*



Witnesses:  
W H Burn 299  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

JOHN C. MORGAN, OF ALLIANCE, OHIO.

## IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 53,170, dated March 13, 1866.

*To all whom it may concern:*

Be it known that I, J. C. MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Steam-Pumps; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the pump. Fig. 2 is an end view. Fig. 3 is a plan view. Figs. 4, 5, 6, and 7 are sectional views, that will be referred to in the description.

Like letters of reference refer to like parts in the several views.

My improvement relates to steam-pumps, as hereinafter described.

A, Figs. 1 and 2, represents a cylinder or main body of the pump, that has flanges *b* at the upper and lower ends, to which a head, *b'*, is coupled at the top, and at the lower end it is coupled to a flange, *b''*, projecting from the lower part, A', of the pump that is secured in a base, B, and is connected to the well or reservoir of water.

C is a side pipe, connected to the main body of the pump at the lower end by a curved pipe, C', to which it is coupled, by means of flanges *c c'*, as represented. In the upper part or end of this pipe, where it is enlarged, there is a valve, D, (seen in Fig. 3,) which is similar to a valve, F, in the lower part, A', of the pump. (Shown in Fig. 1, where the outside is broken away to represent it.)

Inside of the cylinder A there is a float of the size and shape indicated by the red and dotted lines *f* in Fig. 1, to the upper end of which is attached a rod, *g*, that extends up through a stuffing-box, *e*, on the head *b'*. A rope, *h*, is connected to the upper end of the rod *g*, that passes over a pulley, I, and suspends a weight, *h'*, on the other side.

The pulley is supported in a frame, J, being on a shaft, *e'*, that has its bearing in journal-boxes *e''* on the frame.

L is a sleeve on the shaft *e'*, one end of which fits up close against the side of the pulley, and to it is secured a pendulum, I', as shown in Fig. 7, which is a side view of the pulley and pendulum detached. At the other end of the sleeve there is a bent arm, *u*, of the shape rep-

resented in Fig. 6, that strikes against a finger, *n*, projecting upward from a valve, *m*, as shown in Figs. 4 and 5, which are vertical sections through the valve and pipes M N.

*m* is a sliding valve, and *m'* the valve-seat on top the pipe N, in which there are three ports, *r*, *r'*, and *i*. Two of these are opened and one closed by the valve, as represented. The ports *r* and *i* communicate with the steam-pipe N, that enters the side pipe, C, and the middle port, *r'*, with the vertical pipe M, that extends down and enters the cylinder through the head *b'*.

On top of the valve *m*, between it and the frame, and on each side of the finger *n*, there are gibs *p*, for holding the valve down as it slides back and forth, the gibs being kept in place by set-screws screwed through the frame onto the gibs.

In the pulley I there are two slots, *t*, in which wrists *u'* are secured by screw-nuts on one side, whereby they are rendered adjustable and can be moved nearer together or farther apart, so as to operate the valve in such a manner as to cut off the steam at any desired point.

The wrists *u'*, projecting on one side of the pulley, are for turning the pendulum and sleeve on the shaft *e*.

The construction of the pump has now been described, which operates in the following manner: The water entering the pump from the well or cistern raises or opens the valve F, when the water flows in, and as it rises in the cylinder it elevates the float *f*, there having been a vacuum formed above the float by the condensation of steam, that will be referred to again. As the float is moved up into the position indicated by the dotted lines in Fig. 1, the rod *g* and weight *h'* being also in the position indicated, it turns the pulley I so that one of the wrists *u'* will come against the pendulum, as shown in Fig. 7, and move the pendulum around, turning the sleeve L on the shaft, and when the pendulum is carried past the center on the top it will swing down on the other side by its own gravity, and as it swings into this position it causes the arm *u*, at the other end of the sleeve, to strike against the finger *n*, which moves the valve *m* along into the position shown in Fig. 4, opening the ports *r'* and *i*, which allows the steam from the pipe N to pass down into the pipe M and enter the cyl-

inder A, when the pressure of steam on the float will cause it to descend, forcing the water from the cylinder into the side pipe, C, for the valve F is closed by the weight of the water and it must run into the side pipe. As the float descends it draws back the weight, reversing the motion of the pulley, which causes the sleeve and pendulum to turn and swing back into their former position, when the arm *u* strikes against the other side of the finger *n*, as in Fig. 5, that moves the valve so as to open the ports *r* and *r'* and close the other, shutting off steam from the steam-pipe and allowing the steam in the pipe M to pass into the pipe N and into the side pipe, C, where it will come in contact with water and be condensed more or less. When the upper part of the cylinder A is filled with steam that moves down the float, as the steam comes in contact with the water it is condensed, forming a vacuum, so that the float will rise readily by the pressure of water underneath it and around the sides. When the cylinder is supplied with steam it is cut off and condensed by the valve *m*, being in the position shown in Fig. 5. The amount of steam admitted into the cylinder can be gaged by adjusting the wrists *u'* in the slots so as to be nearer or farther apart, that more or less time will elapse before the valve is moved so as to cut off the steam. In this way the pump is operated, the float rising and

falling by the alternate action of steam and water, as described, forcing the water into the side pipe, in which it rises, elevating the valve D and passing into another pipe connected to it, from which it can be discharged into the tank. As the water rises above the valve D it cannot return, for the pressure of the water closes the valve.

What I claim as my improvement, and desire to secure by Letters Patent, is—

1. The pendulum I', sleeve L, and arm *u*, in combination with the slide-valve *m*, gibs *p*, and pipes M N, arranged in the manner and for the purpose substantially as set forth.

2. The pulley I, wrists *u'*, and pendulum I', in combination with the float *f* and weight *h'*, arranged in the manner and for the purpose substantially as described.

3. The float *f*, weight *h'*, and pulley I, in combination with the pendulum I', arm *u*, and valve *m*, arranged in the manner and for the purpose substantially as set forth.

4. The cylinder A, pipe C, and valves F D, in combination with the float *f* and pulley I, rope or chain *h*, and weight *h'*, when arranged in the manner and for the purpose set forth.

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Witnesses:

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