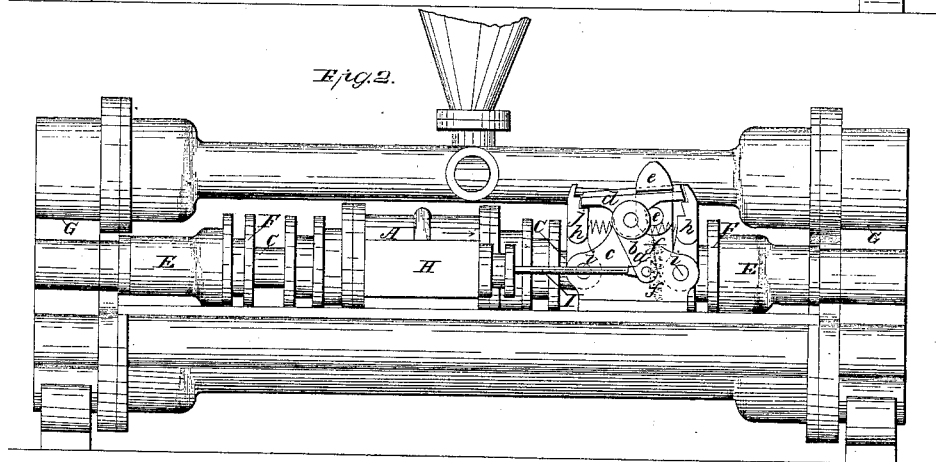
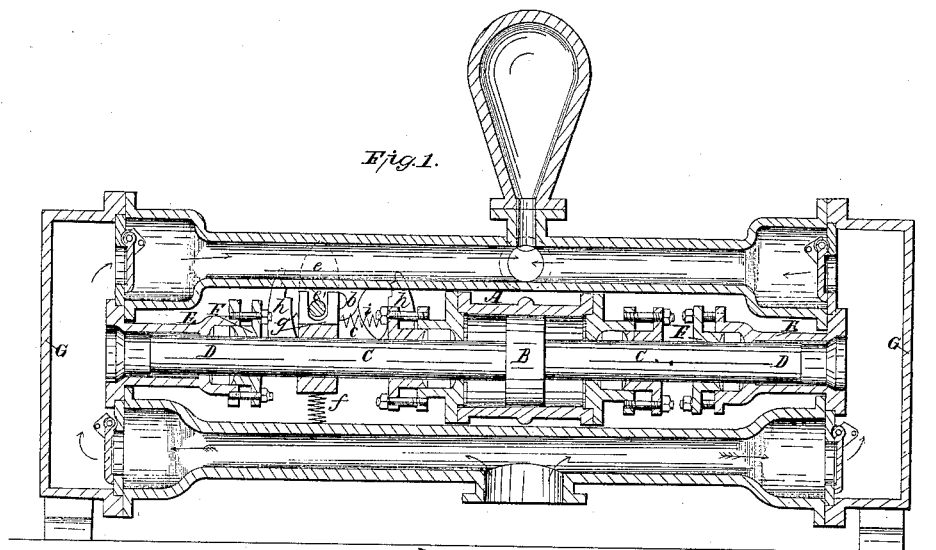


*F. Brown,*  
*Steam Pump.*

*N<sup>o</sup> 51,291.*

*Patented Dec. 5, 1865.*



*Witnesses:*  
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# UNITED STATES PATENT OFFICE.

FELIX BROWN, OF NEW YORK, N. Y.

## IMPROVEMENT IN STEAM-PUMPS.

Specification forming part of Letters Patent No. 51,291, dated December 5, 1865.

*To all whom it may concern:*

Be it known that I, FELIX BROWN, of the city, county, and State of New York, have invented a new and Improved Steam-Pump; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal section of this invention. Fig. 2 is a side elevation of the same.

Similar letters of reference indicate like parts.

This invention relates to a steam-pump in which the ordinary piston-pump is replaced by two plunger-pumps arranged on the opposite ends of the steam-cylinder, and by these means all the difficulties now experienced with the pistons of the piston-pumps and with their cylinders are avoided, the plunger or plungers in this improved pump being so arranged that the packing can be readily tightened and the pump can be made to operate for a long time without requiring any repairs. The steam in the steam-cylinder is changed by a valve-motion of peculiar construction, said motion being composed of a spring-hook which slides on the surface of a double toe that is secured to the rock-shaft governing the position of the steam-valve, and the ends of which rest on stair-shaped spring-catches in such a manner that, by the action of the sliding spring-hook which reciprocates with the piston-rod, the stair-shaped spring-pawls are disengaged and the double toe is caused to change its position, thereby changing the steam-valve instantaneously whenever the steam-piston approaches either end of its stroke.

A represents the steam-cylinder of my pump, in which the piston B moves back and forth in the usual manner. The piston-rod C extends through both heads of the cylinder and its ends form plungers D, which work in barrels E, which are secured one opposite to either head of the steam-cylinder. Said barrels are provided with stuffing-boxes F, of any suitable construction, so that the plungers D can be made to work air or water tight in the barrels E, and regular plunger-pumps are obtained.

The great advantage of the plunger-pump

over an ordinary piston-pump when used as a steam-pump consists particularly in the fact that the piston and cylinder of a piston-pump are liable to wear out very quick by sand or other impurities contained in the water, and, in order to repair them, or even if it is desirable to get at the packing of the pump-piston, the pump has to be stopped and the cylinder has to be opened, all of which causes much trouble and loss of time; whereas, the packing in the plunger-pumps can be readily tightened up from the outside and without even stopping the pump, and if the packing in one of the stuffing-boxes should wear out it can easily be replaced at a trifling expense. The plunger-pumps can be made easy, they are easily kept in repair, and they work just as economically, or more so, as the best piston-pump.

The barrels E of my pumps are secured to the inner plates of the valve-chambers G, each of which contains two valves which open in opposite directions, and one of which leads to the suction-pipe, whereas the other leads to the ascension-pipe. The play of the valves and the operation of the pump will be readily understood from Fig. 1 of the drawings, and requires no further explanation.

The steam in the steam-cylinder A is changed by a valve of any suitable construction, which is inclosed in a valve-chest, H, and the stem I of which connects to an arm, *a*, mounted on a rock-shaft, *b*. This rock-shaft has its bearings in a suitable standard, *c*, which rises from the frame or bed of the pump, and on its inner end is mounted a double toe, *d*, which forms the guide for the sliding spring-hook *e*. This hook is subjected to the action of a spring, *f*, which has a tendency to draw it down, and a reciprocating motion is imparted to it by a slotted standard, *g*, which is mounted on the piston-rod C, and which straddles the end of a pin, *c'*, secured in the inner side of said hook. The ends of the toe *d* rest upon stair-shaped pawls or catches *h h'*, which are mounted on pivots *i i'*, and which are drawn together by a spring, *j*.

In the position in which the pump is shown in Fig. 2 of the drawings the steam-piston is supposed to move in the direction of the arrow marked on the cylinder A, and as the same approaches the thread of its stroke the hook-

slide *e*, by coming in contact with the pawl *h'*, trips the toe *d* and the steam-valve is changed. On the return-stroke of the steam-piston the hook-slide strikes the pawl *h*, and the toe *d* is tripped in the opposite direction, the tripping operation being effected by the action of the spring *f*, which constantly has a tendency to pull said hook-slide down, and which acts on the toe as soon as its point is relieved from the pawl supporting the same, and the pawls *h h'* are so arranged that they alternately support the ends of the double toe on their lower and then again on their upper shoulders or steps, as shown in Fig. 2. By this arrangement the valve is changed at the proper moment with an imperceptible loss of power, and the pump works easy and without a fly-wheel.

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

1. A steam-pump having two or more plungers arranged on the opposite ends of the steam-cylinder, substantially as and for the purpose set forth.

2. The plungers *D*, being the ends of the piston-rod *C*, in combination with the steam-cylinder *A* and pump-barrels *E*, constructed and operating substantially as and for the purpose described.

3. The rocking toe *d*, in combination with the spring-pawls *h h'*, hook-slide *e*, piston-rod *C*, and with the steam-valve of the cylinder *A*, constructed and operating substantially as and for the purpose set forth.

FELIX BROWN.

Witnesses:

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