No. 726,712. PATENTED APR. 28, 1903.

M. LIMNELL.

ROTARY ECCENTRIC PISTON PUMP.

APPLICATION FILED DEC. 31, 1902.

NO MODEL.

Fig. 1.

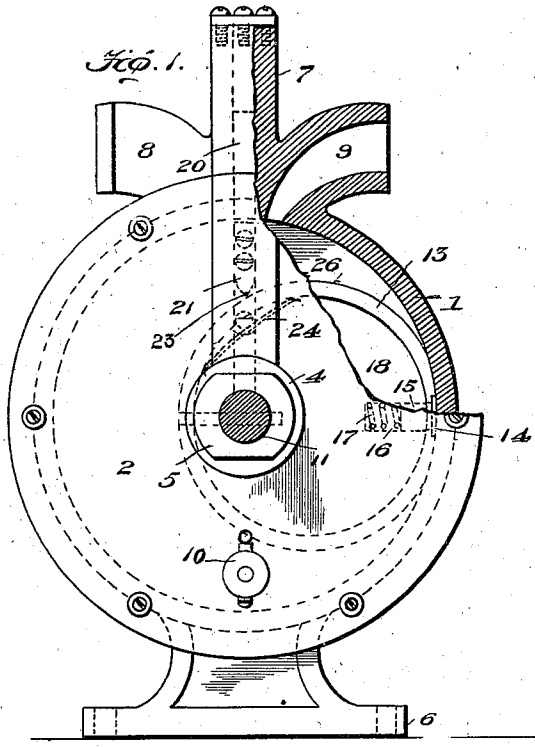


Fig. 2.

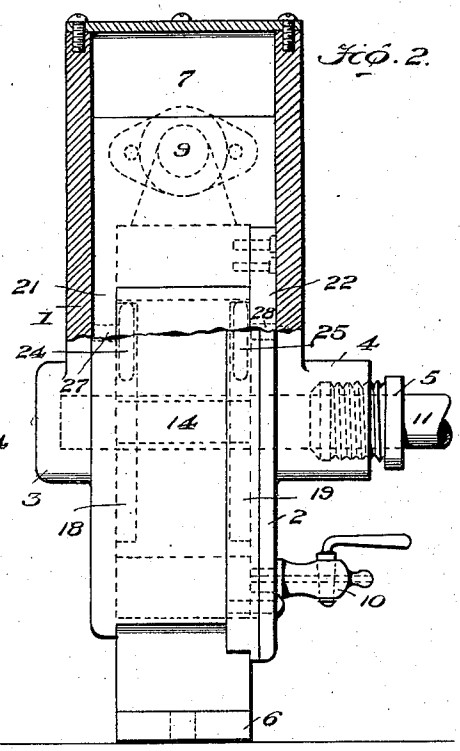


Fig. 3.

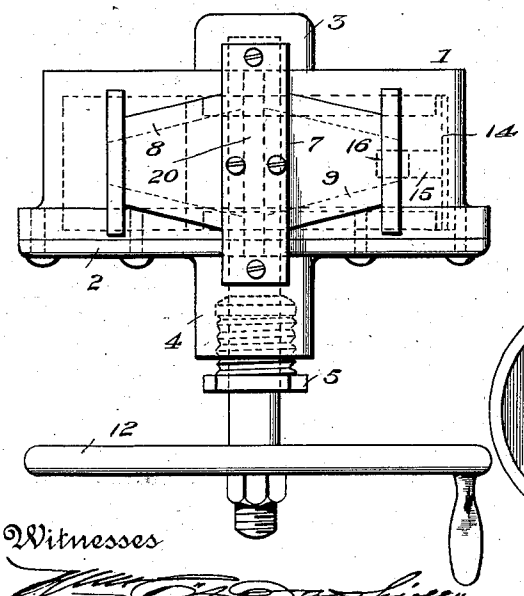


Fig. 5.

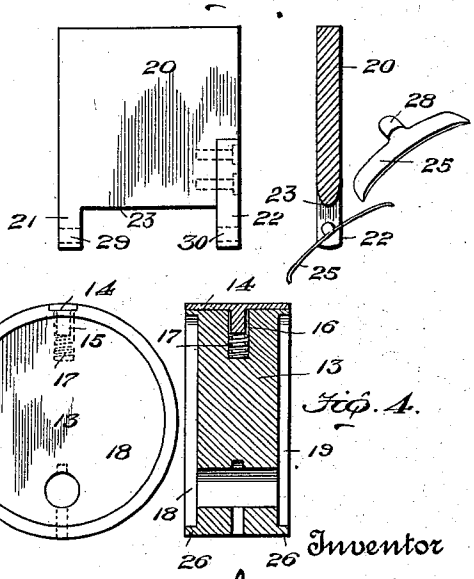


Fig. 4.

Witnesses

Inventor

Mike Limnell

by Henry N. Copp

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MIKE LIMNELL, OF SUPERIOR, WISCONSIN.

ROTARY ECCENTRIC-PISTON PUMP.

SPECIFICATION forming part of Letters Patent No. 726,712, dated April 28, 1903.

Application filed December 31, 1902. Serial No. 137,273. (No model.)

To all whom it may concern:

Be it known that I, MIKE LIMNELL, a subject of the Czar of Russia, (but having declared my intention of becoming a citizen of the United States,) residing at Superior, county of Douglas, and State of Wisconsin, have invented certain new and useful Improvements in Rotary Eccentric-Piston Pumps, of which the following is a specification.

My invention relates to pumps of the eccentric-piston and sliding abutment or gate type.

The object of the present invention is the provision of a pump which will be of simple construction and strong and durable, will require little power to operate the same, which will have large suction and force power and have a continuous discharge, and which can be reversed and also operated noiselessly in practically any position.

A further object of the invention is the provision of an improved and novel connection between the sliding gate or abutment and the eccentric piston, whereby they will coöperate smoothly and perfectly and in a water-tight manner without danger of any disconnection, jarring, or other objectionable manner of work.

To accomplish the foregoing objects, I provide a pump of improved and novel construction, as will appear more fully from the following description, while the novel features will be recited in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation with certain parts of the casing in section. Fig. 2 is an end view, partly in section. Fig. 3 is a plan view; Fig. 4, details of the eccentric piston, and Fig. 5 details of the sliding abutment and connection between it and the piston.

The numeral 1 designates the casing, which is preferably cast in two main parts—the body and the removable cap-plates 2, the body having the hub-bearing 3 and the cap-plate having the hub 4, into which is screwed the stuffing-box 5. The casing has a suitable base 6 and is provided at its top with a guide-box 7 and force and suction couplings 8 and 9. At the bottom of the casing is a drain-plug 10.

The numeral 11 designates a shaft which is journaled in the boxes 3 and 5 and which carries a suitable hand-wheel 12.

Piston 13 is eccentrically mounted on the shaft 11 by a suitable key connection, and it carries a packing member or plate 14, which bears against the interior of the casing and has a shank 15, movable in a radial opening 16 in the piston and pressed by a coil-spring 17. This gives a tight fit between the piston and the casing at all times and prevents any leakage. The opposite sides of the piston are circularly countersunk at 18 and 19, thus providing grooves or depressions for the reception of the springs on the gate or movable abutment.

The gate or movable abutment 20 slides vertically in the gate-box 7, which snugly yet easily receives and guides it, and this gate is of the same width as the interior of the gate-box and casing, and it is provided with a preferably integral arm 21 at one edge and a detachable arm 22 at its other edge, the space between which is just the width of the piston 13, and these arms straddle the piston and bear against opposite sides thereof, the lower edge 23 of the gate being rounded or curved where it rests against the periphery of the piston to prevent any interruption of the movement of the piston or any jar or shock when the member 14 comes in contact with the edge 23 of the gate 20. To prevent any jumping action of the gate and to insure a water-tight fit between it and the piston and generally a smooth coöperation between the piston and the gate, I provide leaf-springs 24 and 25, which are in all respects similar in construction. These springs are formed on a slight arch and of slightly less width than the depth of the countersinks 18 and 19 in the piston, and they are received in said countersinks and arranged so that their ends bear against the rims 26 of the countersinks 18 and 19. These springs are provided with pivots or trunnions 27 and 28, respectively, which are received in apertures 29 and 30 in the arms 21 and 22 of the movable gate or abutment 20, it being understood that the springs are rigidly connected to the trunnions or pivots 27. Thus as the piston rotates the springs can turn slightly with their pivots to compensate for any inequalities of action

which might be due to the pressure or operation of the pump, and the springs constantly exercise a pressure on the rims 26 and keep the edge 23 of the gate held against the periphery of the piston. It will be seen that regardless of the direction of rotation of the piston or its speed the improved connection between the sliding gate or abutment and the piston is such that there is a perfect coöperation, which insures smooth running at all times and prevents any leakage.

I am aware that changes of construction could be resorted to in carrying out my invention, and I lay claim, therefore, to all modifications falling within the spirit and scope of the invention.

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

1. In a pump, the combination with a pump-casing having induction and eduction ports, of a rotary piston in the casing, a gate or abutment slidable in the casing, and a spring connection interposed between the gate and piston and positively connecting them and adapted to maintain the gate or abutment in coöperation with the piston.

2. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, a spring-pressed packing carried by the piston and operating against the casing, a movable gate or abutment in the casing, and a spring connection interposed between the gate and the piston and positively connecting them which permits the passage of the packing by the gate without shock.

3. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, a gate movable in the casing and adapted to bear against the periphery of the piston, and springs carried by the gate and bearing against the piston for holding the gate abutted against the piston.

4. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, a movable gate in the casing which has arms straddling the piston, and springs carried by the arms and bearing against the piston which maintain the gate in contact with the piston.

5. In a pump, the combination with a casing having induction and eduction ports, of a piston rotatable in the casing, a movable gate adapted to bear against the periphery of the piston, and leaf-springs carried by the gate and bearing against the piston which insure the abutment of the gate and piston.

6. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, a movable gate bearing against the periphery of the piston, and leaf-springs bearing on the piston which are journaled or pivoted to the gate, said springs insuring the engagement of the piston and gate.

7. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, said piston having countersinks in its sides, of a movable gate or abutment, and springs carried by the gate or abutment and located in the countersinks and bearing against the piston and maintaining engagement of the gate and piston.

8. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, said piston having countersinks in its sides which provide the piston with a rim, a movable gate having arms straddling the piston, and leaf-springs carried by said arms, said springs being received in the countersinks and bearing against the rim of the piston and maintaining the engagement of the piston and gate.

9. In a pump, the combination with a casing having induction and eduction ports, of a rotary piston in the casing, said piston having countersinks in its sides which provide a rim, a movable gate or abutment having arms which straddle the piston, a portion intermediate the arms which abuts the periphery of the piston, and bowed leaf-springs having trunnions pivoted to the arms, said leaf-springs being located in the countersinks and having their ends bearing against the rim of the piston and maintaining the engagement of the piston and gate.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

MIKE LIMNELL.

Witnesses:
GOST WEHVILAINER,
JOHN FISTEL.