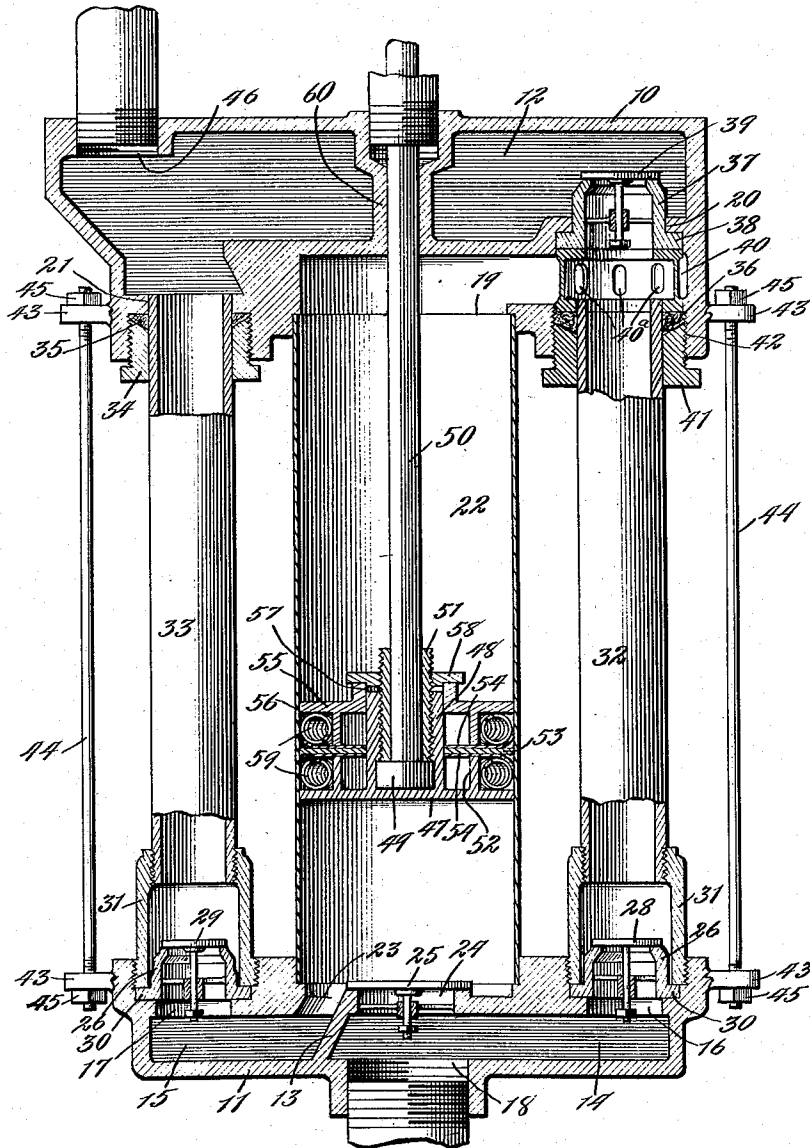


A. A. BOWSER.
DOUBLE ACTING PUMP.
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932,531.

Patented Aug. 31, 1909.



Witnesses:

Wm D. Perry
J. F. Gochman Jr.

Inventor:

A. A. Bowser
by Brown & Hopkins
Attys

UNITED STATES PATENT OFFICE.

ALLEN A. BOWSER, OF FORT WAYNE, INDIANA, ASSIGNOR TO S. F. BOWSER & COMPANY, INCORPORATED, OF FORT WAYNE, INDIANA, A CORPORATION OF INDIANA.

DOUBLE-ACTING PUMP.

932,531.

Specification of Letters Patent.

Patented Aug. 31, 1909

Application filed April 11, 1907. Serial No. 367,558.

To all whom it may concern:

Be it known that I, ALLEN A. BOWSER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Double-Acting Pumps, of which the following is a specification.

This invention relates to improvements in double acting pumps and the primary object of the invention is to provide an improved device of this character for pumping a steady or continuous stream of liquid.

A further object is to provide an improved device of this character which will be simple, cheap and durable in construction, and effective and efficient in operation.

To the attainment of these ends and the accomplishment of other new and useful objects, as will appear, the invention consists in the features of novelty in the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawing, illustrating an exemplification of the invention and in which the figure is a longitudinal sectional view, partly in elevation, of an improved pump of this character constructed in accordance with the principles of this invention.

Referring more particularly to the drawing and in this exemplification of the invention, the numerals 10 and 11 designate two heads, the head 10 being provided with a chamber 12 and the head 11 being provided with a partition 13 to divide said head into two chambers 14, 15. The chambers 14 and 15 of the head 11 are provided respectively with outlet openings 16, 17, and leading into the chamber 14 is an inlet opening 18. The head 10 is provided with a passage 19 which opens through one of the faces of the head and has communication with the chamber 12 through a suitable aperture or opening 20. The chamber 12 is also provided with an inlet aperture 21, which has communication with the chamber 12 independent of the communicating passage 19.

A piston cylinder 22 which is preferably open at both ends is disposed between the two heads 10, 11, so that one end will communicate with the passage 19 in the head 10 and the other end will have communication with the chamber 15 in the head 11, through the opening 23 and with the chamber 14 through the opening 24. A suitable up-

wardly opening valve 25 is arranged to close the opening 24.

Disposed within the openings 16, 17 are suitable valve seats 26 upon which rest upwardly opening valves 28, 29, and each of said valve seats 26 is preferably provided with a circumferential flange 30, which is adapted to rest upon a suitable support in the head 11, and said valve seats are preferably held against displacement by means of collars or bushing 31, which are provided with peripheral screw threads adjacent one end adapted to engage suitable screw threads in the head 11 adjacent the openings 16, 17, and when said collars or bushings are seated in the apertures, one of the extremities thereof will engage and rest upon the circumferential flange 30. These apertures or openings 16, 17 are preferably arranged on each side of the piston cylinder 22.

Removably secured to the free extremities of the collars or bushings 31 are tubular members 32, 33. The upper extremity of the tubular member 33 is adapted to be seated in the aperture or opening 21 in the head 10 so as to communicate with the chamber 12 and said end is held in place in any suitable manner, preferably by means of a bushing 34 which surrounds the extremity of said tubular member and is provided with peripheral threads adapted to engage suitable threads in the head 10 and disposed between the bushing 34 and the head 10 and surrounding the extremity of the tubular member 33 is suitable packing material 35. The head 10 is also provided with a suitable aperture 36, which is preferably arranged in line with the aperture 20 and has communication with the passage 19 and said aperture 36 is preferably of a diameter greater than the diameter of the aperture 20. Seated within the aperture 20 is a valve seat 37, which is preferably provided with a circumferential flange 38 adapted to engage a suitable seat in the head 10 and resting upon the valve seat 37 is an upwardly opening valve 39, which latter is preferably located within the chamber 12.

A suitable ring or bushing 40, provided with spaced slots or apertures 40^a in the wall thereof, is adapted to be placed in the passage 19 and is of such a diameter as to permit said ring or bushing to be placed in position and inserted through the aperture 36, and when in position one edge thereof

will engage and rest against the circumferential flange 38 on the valve seat 37. The upper extremity of the tubular member 32 is adapted to be inserted in the aperture 36 and said tubular member 32 is of such a length that the free extremity thereof will stand within the opposite end of the ring or bushing 40, and tends to hold the ring or bushing in position.

Any suitable means may be provided for securing the end of the tubular member 32 adjacent the ring or bushing 40 in position, such as a collar or bushing 41, which surrounds the extremity of the tubular member 32 and said collar or bushing 41 is preferably provided with peripheral screw threads adapted to engage suitable threads in the aperture or opening 36. Disposed between the extremity of the collar or bushing 41 and the adjacent edge of the ring or bushing 40 is suitable packing material 42 to form a fluid tight joint and when the collar or bushing 41 is screwed into the aperture 36, the extremity of the tubular member 32 will be firmly held in position.

Any suitable means may be provided for securing the heads 10 and 11 together and for holding the piston cylinder 22 in position. A suitable and efficient means for accomplishing this purpose comprises projecting ears or lugs 43 arranged on the heads 10 and 11 and respectively opposite each other, and said ears or lugs are preferably provided with apertures through which the extremities of suitable tie rods or bolts 44 are adapted to pass and said rods or bolts are held against displacement preferably by means of nuts 45 engaging threaded extremities thereof. The chamber 12 is provided with an outlet opening 46 through which the liquid may be discharged.

Movable within the piston cylinder 22 is a piston head comprising a main body portion 47 having a recessed tubular projection 48, which is provided with interior screw threads and seated within said tubular projection 48 so as to engage and rest upon the bottom thereof is an enlarged portion or head 49 of a piston rod 50. Surrounding the piston rod is a sleeve or collar 51 which is preferably provided with exterior screw threads and said sleeve or collar 51 is of a size to enter the tubular projection 48 so that the threads thereon will engage the threads in said projection and when the sleeve or collar 51 is seated the extremity thereof will engage and rest upon the upper face of the enlarged portion or head 49 of the piston 50. The piston head 47 is provided with a circumferential rib or projection 52 extending above the upper face thereof, and located at a point intermediate the tubular projection 48 and the periphery of said head and supported by the rib 52 is a disk or member 53, which is of a diameter substantially equal

to the diameter of the piston head 47 and surrounds the tubular projection 48.

If desired, suitable flexible material, such as leather washers 54 or the like, may be arranged on each side of the disk or member 53 and said flexible washers are preferably of a diameter slightly greater than the diameter of the piston cylinder 22 so as to cause the extremities of said disks or washers to be slightly deflected as shown.

A cap or member 55 is also provided with a circumferential rib or projection 56, which is located at a point remote from the periphery thereof and said cap or member is provided with an aperture 57, which is adapted to receive the tubular projection 48, so that when placed in position the rib or projection 56 will rest against the upper face of the disk or washer 53 resting upon the flexible member 54, and said cap or member 55 is held from displacement by means of a suitable jam-nut 58, which is adapted to engage the peripheral threads of the sleeve or collar 51 and said jam-nut serves to hold the parts of the piston together. If desired, suitable flexible members 59, such as coil springs or the like, may be disposed around the respective ribs or projections 52, 56 so as to stand adjacent the wall of the piston cylinder 22 and said flexible members tend to hold the extremities of the flexible members 54 yieldingly against the wall of the piston cylinder 22. The upper portion of the piston rod 50 is adapted to pass through a suitable bearing 60 in the head 10.

In use and assuming the piston to be in the position as shown, when the piston head is drawn upwardly in the piston cylinder 22, fluid will be drawn through the inlet opening 18 in the head 11 and into the piston cylinder 22 through the opening 24 which will fill the piston cylinder below the piston. When the piston head descends, the fluid thus drawn in will be discharged through the opening 23 into the chamber 15 through the opening 17, past the valve 29, through the tubular member 33, into the chamber 12 in head 10 and out through the discharge opening 46. As the piston descends, the valve 25 will be seated and a suction will be created in the upper portion of the cylinder 22, which will draw the fluid through the opening 18 into the chamber 14, through the opening 16, past the valve 28 through the tubular member 32, through the passage 19 and into the piston cylinder above the piston. The suction thus created will cause the valve 39 to be seated and when the piston is moved in the opposite direction, the valve 28 will be seated and the fluid forced through the passage 19 through the openings 40^a, past the valve 39 into the chamber 12 in the head 10 and out through the discharge opening 46; at the same time the suction caused in the piston cylinder below the

piston 47 will unseat the valve 25 and draw an additional supply of fluid into the cylinder 22 below the piston. The suction thus created will also seat the valve 29. Thus it will be seen that upon each movement of the piston a supply of fluid will be discharged into the chamber 12 and through the outlet 46, thereby furnishing a continuous flow from said opening. It will also be noted that with this improved construction of pump, the parts may be readily dis-assembled when desired.

In order that the invention might be fully understood by those skilled in the art, the details of the foregoing embodiments thereof have been thus specifically described, but

What I claim as new and desire to secure by Letters Patent is—

1. In combination, a pump including spaced chambered heads, one of said heads being provided with a supply inlet and a plurality of outlet openings, the other head having an inlet passage communicating with the chamber and being provided with a discharge outlet, a piston cylinder disposed between the heads and having communication with one of the outlets in the first said head, and the inlet passage in the other head, valves for controlling the said outlet and passage, a tubular bushing provided with an aperture in the wall thereof disposed within the said passage and communicating with the respective chamber, said passage having communication with the chamber through the aperture in the wall of the bushing, a tubular member communicating with the other outlet in the first said head and having communication with the chamber in the other head directly through the tubular bushing, means for securing the member in position, valves for controlling the extremities of said tubular member, a piston movable within the cylinder, the valves for outlets of the first said heads being adapted to be unseated by the movement of the piston to alternately admit the liquid into the cylinder on opposite sides of the piston, the liquid admitted through the tubular member being discharged through the bushing, and means for permitting the discharging of the liquid on the other side of the piston.

2. In combination, a pump including spaced chambered heads, one of said heads being provided with an inlet opening and a passage communicating with the chamber through the opening therein, said head being also provided with an aperture communicating with the passage and in line with the first said inlet, the other head being provided with an inlet and an outlet, removable valve seats respectively in the outlet of the last said chamber and the inlet of

the first head, a tubular member disposed between the heads, one end of said member being adapted to engage and hold one of the valve seats in position, means cooperating with the other end to removably hold the other valve seat in position, valves cooperating with the seats, a cylinder communicating with both heads and a piston movable in the cylinder.

3. In combination, a pump including spaced chambered heads, one of said heads being provided with an inlet aperture and a passage communicating with the chamber through the aperture, said head being also provided with an aperture communicating with the passage and in line with the first said inlet, the other head being provided with an inlet and an outlet, a removable valve seat in the outlet of the last said chamber and the inlet of the first head, an apertured bushing in the passage of the first said head and engaging the valve seat, a tubular member disposed between the heads, one end of said member being adapted to engage and hold one of the valve seats in position, the other end engaging the apertured bushing to hold the valve seats in position, valves cooperating with the valve seats, a cylinder communicating with both heads and a piston movable in the cylinder.

4. In combination, a pump including spaced chambered heads, one of said heads being provided with an inlet and an outlet opening, a valve seat provided with a peripheral flange seated within the outlet opening, the other head being provided with an inlet and an outlet opening, a valve seat provided with a peripheral flange seated within the inlet opening, the last said head being also provided with a passage communicating with the head through the inlet opening therein, said head also having an aperture communicating with the passage in line with the inlet opening to the chamber, an apertured bushing adapted to be inserted into the passage through the last said opening to engage the flange on the valve seat, a tubular member, one end of which is seated in the opening and engaging the bushing and the other end in the outlet opening of the other head to hold the valve seats in position, valves for said seat, a cylinder having communication with the heads, and a piston movable in the cylinder.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 27th day of March A. D. 1907.

ALLEN A. BOWSER.

Witnesses:

S. B. BECHTEL,
H. M. BOWSER.