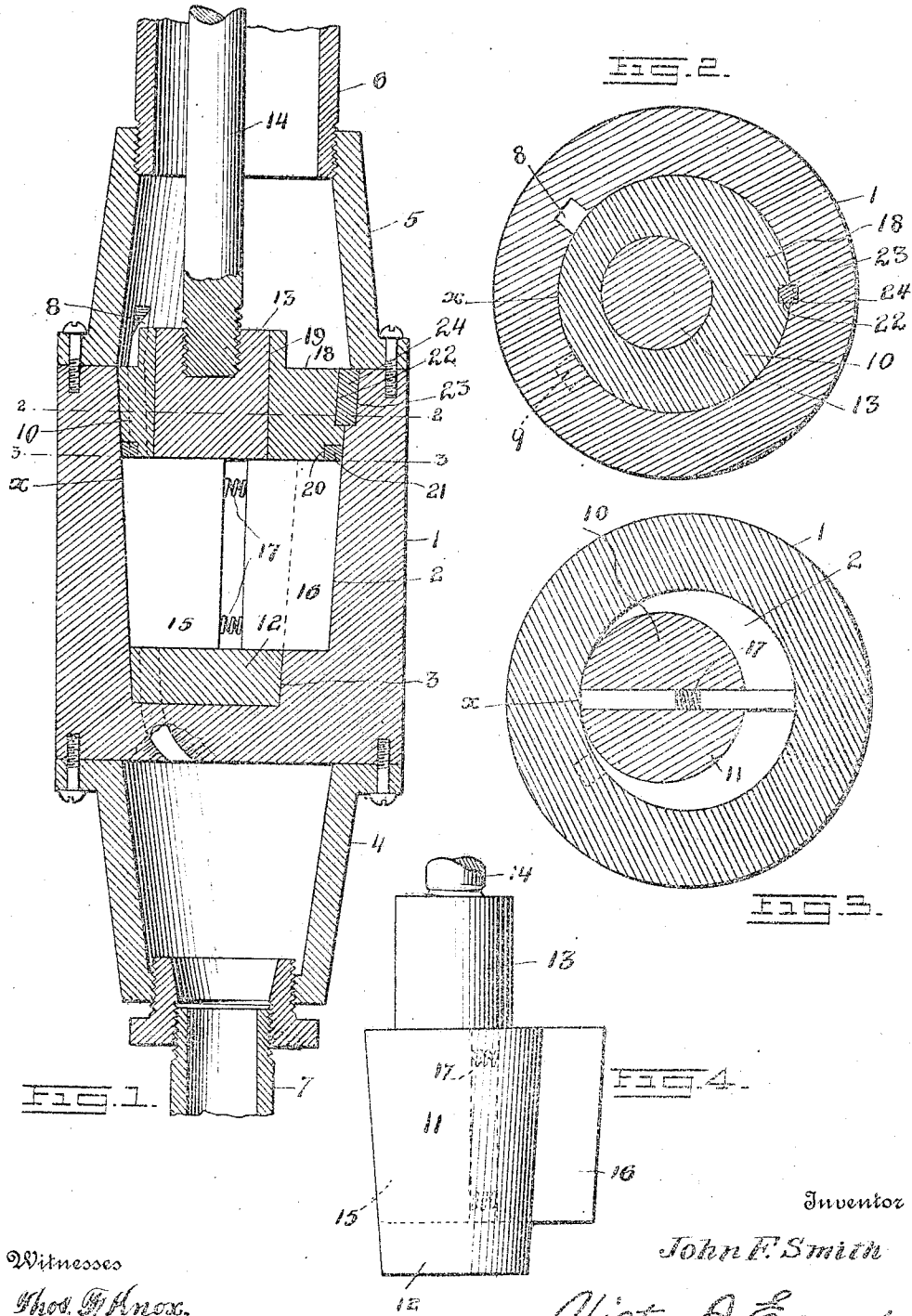


J. F. SMITH.
 ROTARY PUMP.
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1,045,754.

Patented Nov. 26, 1912.



Witnesses

Thos. H. Knox,

Edwards & Sons

Inventor

John F. Smith

By *Victor J. Evans*

Attorney

UNITED STATES PATENT OFFICE.

JOHN F. SMITH, OF WOOSTER, OHIO, ASSIGNOR OF ONE-HALF TO JACOB FREDRICK,
OF WOOSTER, OHIO.

ROTARY PUMP.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN F. SMITH, a citizen of the United States, residing at Wooster, in the county of Wayne and State of Ohio, have invented new and useful Improvements in Rotary Pumps, of which the following is a specification.

This invention relates to rotary pumps or engines and the object thereof is the provision of a device of this character so constructed that the piston will be kept automatically in tight engagement with the cylinder wall at all times irrespective of wear.

A further object of the invention is the provision of means for holding the piston on its seat, said means being so constructed that it will automatically follow the piston and hold the same in tight engagement with the walls of the cylinder irrespective of the wear thereof and will also automatically take up its own wear.

Further objects of the invention will appear as the following description is read in connection with the accompanying drawings, which form a part of this application, and in which:—

Figure 1 is a vertical longitudinal section through the pump casing. Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1. Fig. 3 is a similar section on the line 3—3 of Fig. 1. Fig. 4 is a detailed vertical elevation of the rotor removed from the casing.

Referring more particularly to the drawing, 1 represents the casing which may have any suitable outside configuration but which preferably has a circular periphery, so as to present no projecting parts when the device is used as a pump for insertion in well tubing or the like. The interior of the casing is provided with a conical well or chamber 2 having an eccentrically disposed conical socket 3 at its base. At each end of the casing suitable tubular caps 4 and 5 are placed, the latter being connected with the outlet pipe 6, and the former being connected with an inlet pipe 7. Suitable inlet and outlet ports 8 and 9 are formed in the casing and are positioned on opposite sides of the point *a* on the casing which is engaged by the piston 10, this point being the division line between suction and discharge.

The rotor or piston 10 comprises an inverted frusto-conical body 11 having de-

pending therefrom an inverted frusto-conical stud or boss 12 adapted to enter the socket 3 with its terminal end free from the bottom of said socket. The upper part of the body 11 has secured thereto a shaft attaching boss 13 to which is connected, in any suitable manner as by means of the thread shown, the driving shaft 14. The body 11 is transversely slotted from the boss 12 to the boss 13 and has mounted therein a pair of sliding piston wings 15 and 16 which are pressed in opposite directions by means of the springs 17 interposed therebetween. These springs normally maintain the wings in engagement with the walls of the chamber 2 and when the wing 15 engages the wall at the division line *a*, the wing 16 will be bridged across the opening between the rotor and the opposite wall.

The upper wall of the cylinder is made in the form of a heavy ring 18 which is provided with an eccentric aperture 19 there-through to permit the passage of the boss 12. The lower end of this ring normally rests upon the upper end of the rotor and is provided with an annular recess 20 in which is seated a split packing ring 21. The periphery of the ring 18 is made conical so as to fit the walls of the chamber 2 and at one side a vertical groove 22 is formed which is adapted to register with a similar groove 23 in the casing. These grooves are adapted to receive a locking pin 24 which prevents the ring 18 from turning and holds it against vertical movement. This pin is held in position by the cap 5. When the device is used as a pump the shaft 14 will rotate and the water or other fluid sucked into the chamber 2 through the port 8 and discharged through the port 9, and when the device is used as a rotary engine steam or other fluid under pressure is forced into the chamber 2 through the pipe 7 and the port 8 and acts upon the wings to rotate the piston 10, the shaft acting as a driving shaft.

In cases where the piston or rotor is eccentric to the cylinder walls but revolves on a concentric axis, it is necessary to keep the piston or rotor in engagement with one wall of the cylinder at all times and it will be seen that I have provided a very simple means which is automatic in its action to produce this result. When the device is used as a pump the pressure of the water upon

the ring 18 maintains the same and the piston or rotor in tight engagement with the cylinder walls and therefore obviates leakage between the suction and discharge sides of the pump.

Having thus described the invention, what I claim as new is:—

1. In combination, a casing having a conical chamber therein with an eccentric socket, a conical piston seated in the chamber and having an extension seated in the socket, and means coacting with the extension to hold the piston in engagement with one wall of the chamber, said means permitting the piston to rest freely in the conical chamber.

2. A pump comprising a casing having a conical piston chamber, a conical piston therein, means for holding said piston eccentrically in the chamber against one wall thereof, said means permitting the piston to rest freely on the base of the chamber, and piston wings carried by the piston.

3. A pump comprising a casing having a conical piston chamber, a conical piston therein, means for holding said piston eccentrically in the chamber against one wall thereof, said means permitting the piston to rest freely on the base of the chamber, and spring pressed piston wings slidably mount-

ed in the piston and conforming with the walls of the chamber.

4. In a device of the character described, the combination with a piston casing having a conical piston chamber therein, and a conical socket depending from the chamber and eccentrically positioned therein, of a conical piston having a conical boss seated in said socket and a connecting boss, of a packing ring fitting the walls of the chamber and having an eccentrically disposed aperture to receive the connecting boss, means to prevent turning of said packing ring, said means permitting the packing ring to rest freely on the piston, spring pressed piston wings carried by the piston, said piston being adapted to rest freely against the base of the chamber and having one side resting against one wall of the chamber, together with inlet and outlet ports on opposite sides of the engaging point, and pipe connecting caps secured to the casing, one of said caps securing said means in place.

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

JOHN F. SMITH.

Witnesses:

E. EDMONSTON, Jr.

L. E. WALTERS.