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ROTARY PUMP FOR VACUUM SYSTEMS.

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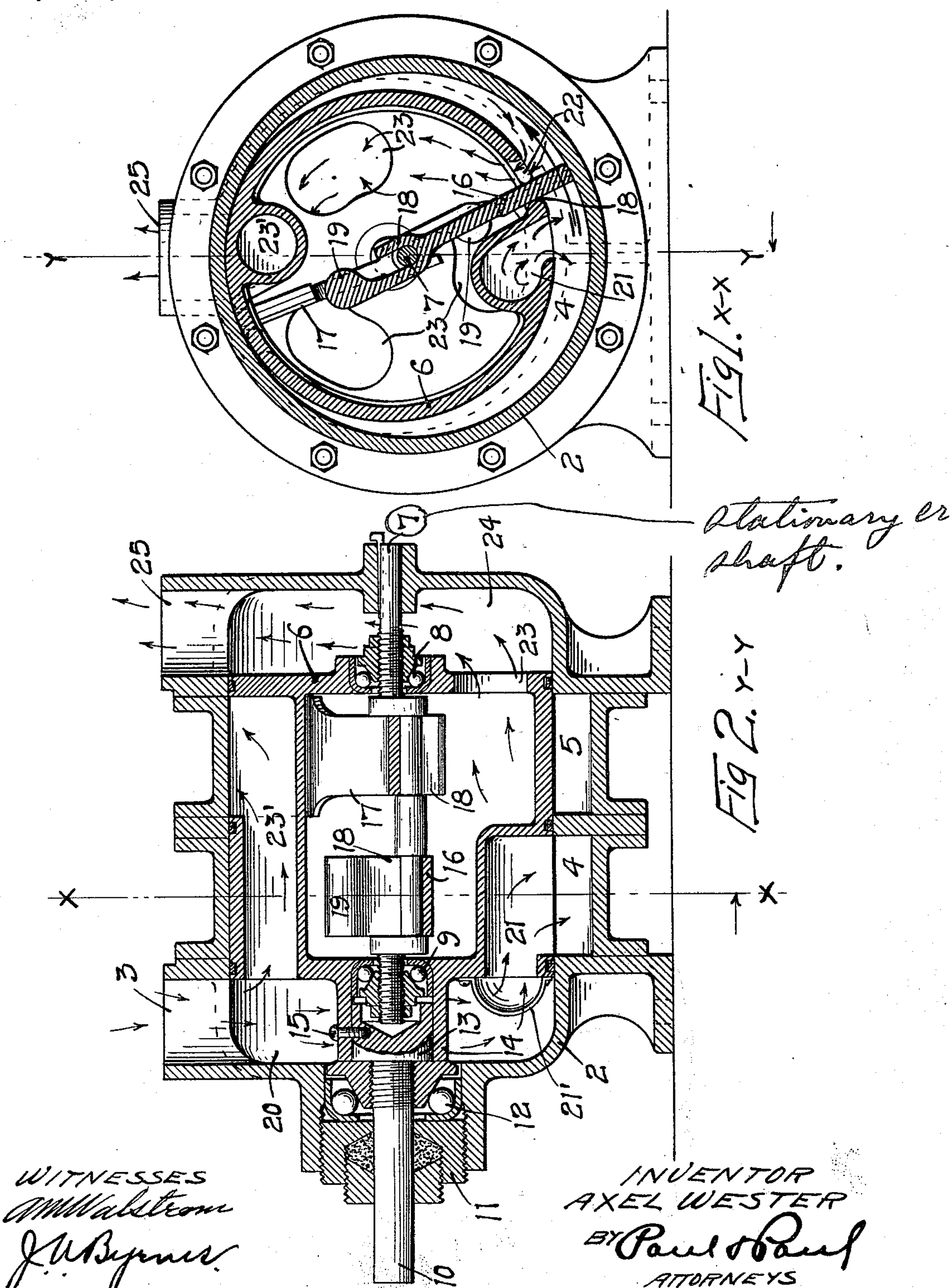
1,000,566. Patented Aug. 15, 1911.



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To all whom it may concern:

Be it known that I, AXEL WESTER, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Rotary Pumps for Vacuum Systems, of which the following is a specification.

The object of my invention is to provide a rotary pump having a driven piston by means of which air or other fluid may be drawn in one side of the pump and delivered on the other side at a distant point.

A further object is to provide a pump of simple, economical construction and one that is particularly suited for the purpose designed.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a transverse sectional view of a rotary pump embodying my invention, taken on the section line x—x of Fig. 2, Fig. 2 is a longitudinal sectional view on the line y—y of Fig. 1.

In the drawing, 2 represents the casing or cylinder of the pump having on one side an intake opening 3 and provided with eccentrically arranged chambers 4 and 5.

6 is a hollow piston.

7 is a stationary crank shaft mounted at one end in the wall of the casing and provided with ball bearings 8 and 9 on which the piston 6 is adapted to revolve. A drive shaft 10 passes through a box 11 provided in one end of the casing and has a ball bearing 12 therein, and a hub 13 at its inner end fitting within a sleeve 14 provided on the end of the piston and secured thereto by a set screw 15. Power applied to the shaft 10 will revolve the piston 6. Slides 16 and 17 have forked inner ends 18 which straddle the crank shaft 7 and their outer ends are slidable in slots 18′ provided in the walls of the piston. The inner ends of the slides are also provided with the weights 19 for counterbalancing purposes. The revolution of the piston will cause the slides to move back and forth in the slots 18′ in the piston while their outer ends will remain in contact with the walls of the chambers during the complete revolution of the piston. The intake port 3 communicates with the chamber 20 at the end of the cylinder casing inclosing the bearing of the piston and communicating with a port 21 which leads to the chamber 4 in the rear of the slide 17. In front of the port 21 I prefer to provide a guide or wing 21′, which has the effect of directing the air currents through the port. The slide, as it moves in said chamber, will create a suction behind it, drawing in the air through the opening 3 and the port 21 and on the next revolution of the slide the air so drawn in will be conducted to a point in front of the slide and be forced thereby through the slot 22 into the interior of the piston and thence through the port 23 to the chamber 24 and the outlet opening 25. The other chamber 5 communicates through the passage 23′ with the chamber 20 and the opening 3 and the slide therein operates in a similar manner to the one described. The piston, as indicated in Fig. 1, is eccentrically mounted with respect to the cylinder, while the stationary crank shaft is concentric with respect to the cylinder, the slides moving back and forth in their slots in the piston as it revolves. The air or other fluid discharged from the port 25 may be delivered at any desired distance from the pump.

The pump may be made in various sizes, using additional slides if preferred, and the area of these slides may be varied without departing from the spirit of my invention.

I claim as my invention:—

1. A rotary pump comprising a casing having fluid intake and discharge ports and inlet and outlet chambers at the ends of said casing communicating respectively with said ports, a stationary crank shaft mounted in said casing, a piston journaled thereon and forming, with the casing, annular chambers, slides mounted at their inner ends on said crank shaft and projecting outwardly through slots in the walls of said piston into said annular chambers, whereby when said piston is revolved said slides will be reciprocated, a drive shaft connected with one end of said piston, said piston having ports extending lengthwise therein and communicating at one end with said inlet chamber and at their opposite ends with said annular chambers respectively in the rear of said slides, and said piston having slots in advance of said slides communicating with said annular chambers respectively and with ports in the wall of said piston leading to said outlet chamber, substantially as described.

2. A rotary pump comprising a casing having fluid intake and discharge ports, a stationary crank shaft mounted in said casing, a piston journaled thereon and forming, with the casing, annular chambers, slides mounted at their inner ends on said crank shaft and projecting outwardly through slots in the walls of said piston into said annular chambers, whereby when said piston is revolved said slides will be reciprocated, said piston having ports extending lengthwise therein and communicating at one end with said inlet chamber and at their opposite ends with said annular chambers respectively in the rear of said slides, said piston having slots in advance of said slides communicating with said annular chambers respectively and with ports in the wall of said piston leading to said discharge port, and a drive shaft operatively connected with said piston.

3. A rotary pump comprising a casing having fluid intake and discharge ports, a stationary crank shaft mounted in said casing, a piston journaled on said crank shaft and free to revolve thereon and forming, with said casing, annular chambers, two slides mounted at their inner ends on said crank shaft and projecting outwardly through slots in the walls of said piston into said annular chambers, whereby when said piston is revolved said slides will be reciprocated, said piston having a port extending from end to end thereof and leading from said inlet port to one of said annular chambers and also having a second port extending partially through the length of the piston and leading from said inlet port to said other annular chamber, said piston having slots in advance of said slides communicating with said annular chambers respectively, and the wall of said piston having also a discharge opening communicating with said discharge port, for the purpose specified.

4. A pump for vacuum cleaning systems comprising a casing having inlet and outlet ports and receiving and discharge chambers communicating with said ports, a stationary crank shaft, a driven piston mounted thereon and forming, with said casing, eccentrically arranged annular chambers, slides mounted on said crank shaft and projecting through the walls of said piston into said chambers respectively, said piston having ports connecting said receiving chamber with said eccentrically arranged chambers respectively and also having ports communicating with said chambers in advance of said slides and with said discharge chamber, substantially as described.

5. A rotary pump for vacuum systems comprising a casing having inlet and outlet ports, a driven piston arranged within said casing and forming, with said casing, an annular eccentrically arranged chamber, a slide carried by said piston and projecting through the walls thereof into said chamber and having its outer end normally contacting with the wall of said chamber and capable of a limited longitudinal movement as said piston revolves, said piston having passages communicating respectively with said inlet and outlet ports and with said chamber in the rear, and in front of said slide, for the purpose specified.

6. A rotary pump comprising a casing having inlet and outlet ports, a driven piston arranged within said casing and forming therewith annular chambers, slides mounted in said piston and projecting through the walls thereof and contacting at their outer ends with the walls of said chambers, said piston having passages communicating respectively with said inlet and outlet ports and with said chambers in the rear and in front of said slides, substantially as described.

In witness whereof, I have hereunto set my hand this 16th day of May 1910.

AXEL WESTER.

Witnesses:
G. E. SORENSEN,
J. A. BYRNES.