(No Model.) 2 Sheets—Sheet 1.

O. SEIFERT.

ROTARY PUMP.

No. 383,996. Patented June 5, 1888.

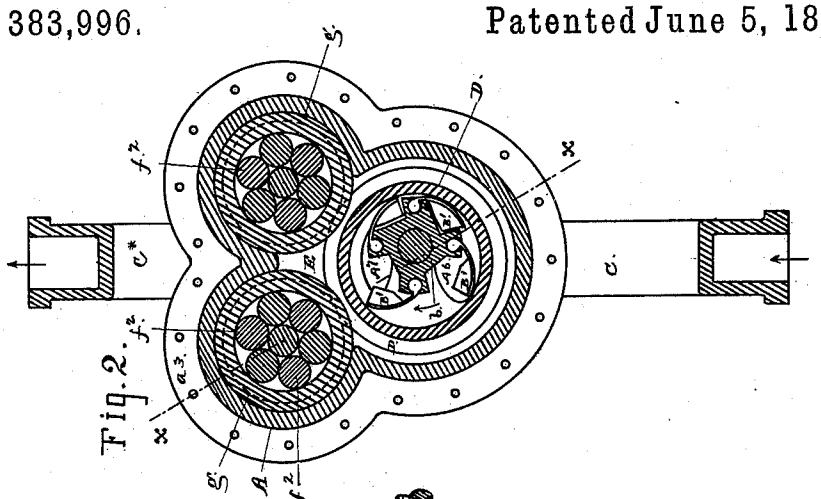


Fig. 2.

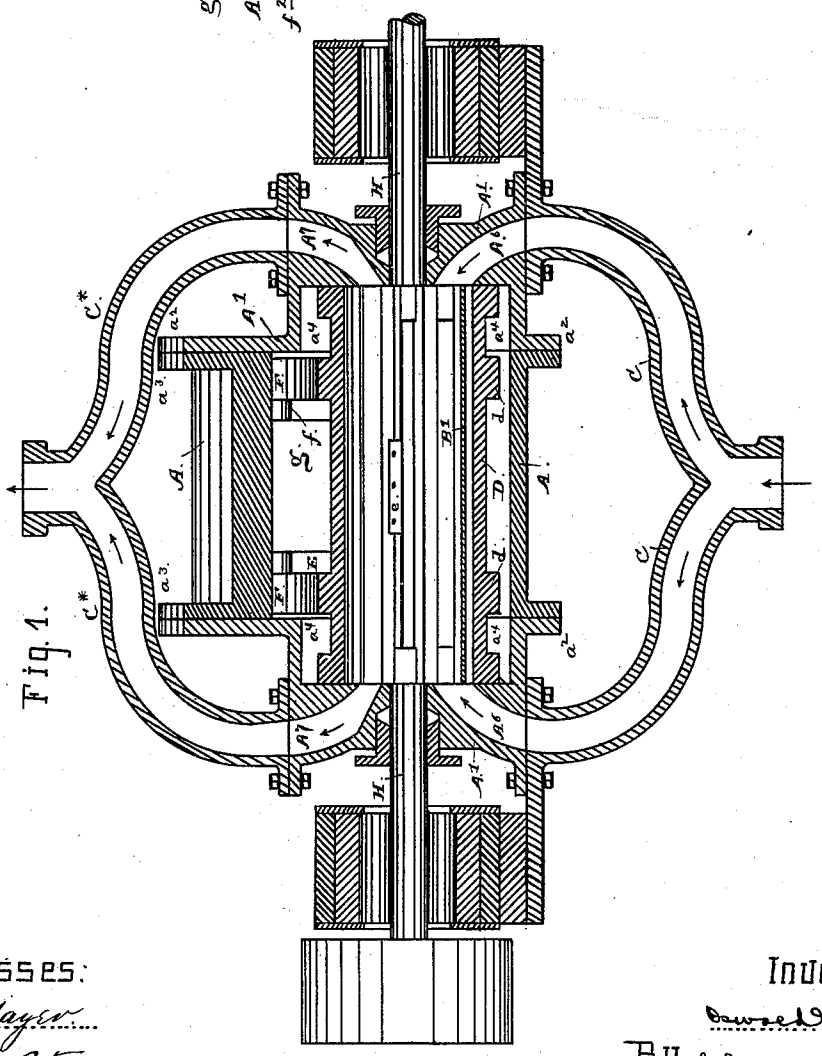


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

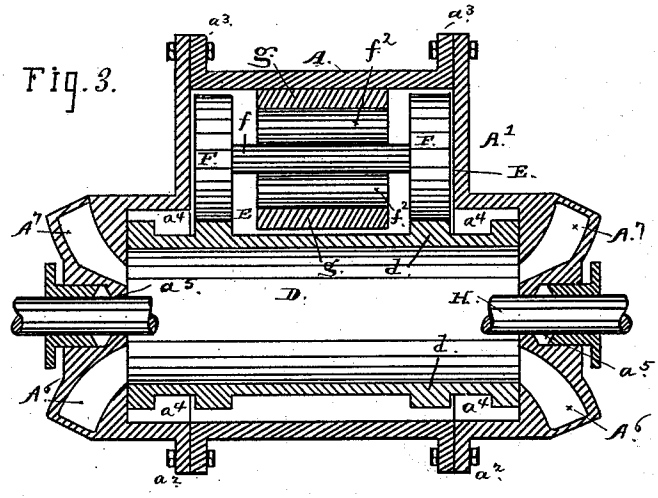
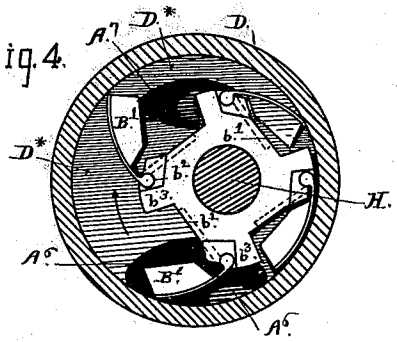


Fig. 4.



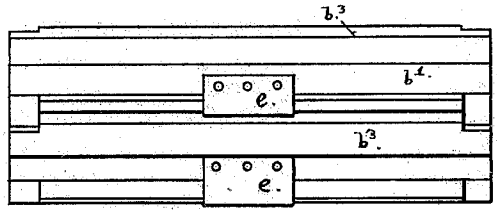


Fig. 5.

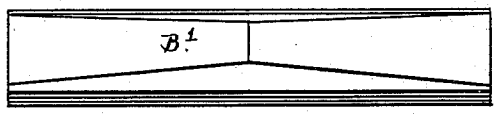


Fig. 6.

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UNITED STATES PATENT OFFICE.

OSWALD SEIFERT, OF SAN FRANCISCO, CALIFORNIA.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 383,996, dated June 5, 1888.

Application filed January 20, 1887. Serial No. 224,936. (No model.)

To all whom it may concern:

Be it known that I, OSWALD SEIFERT, a citizen of the United States, residing in the city and county of San Francisco, in the State of California, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to improvements in rotary-piston pumps of that kind or class in which the piston is set eccentrically within its surrounding cylinder or case.

These improvements consist of certain novel construction and combination of stationary case, revolving cylinder, piston, and bearings, as hereinafter fully set forth.

The nature of these improvements and the manner in which I apply and combine them for operation are fully explained in the following description and the drawings that accompany it.

Figure 1 is a sectional view in elevation, the section being taken through the bed-plate, shaft-supports, case, and water-passages. Fig. 2 is a transverse section in elevation through stationary case, revolving cylinder, piston, and water-passages. Fig. 3 is a longitudinal section through case and cylinder to show the bearing-rollers of cylinder. This view is taken through *x x*, Fig. 2. Fig. 4 is a cross-section of the loose cylinder and an end view of the piston. Fig. 5 is a top or side view of the piston. Fig. 6 is a detail showing the form of the piston-wings.

The case consists of three parts, A A′ A′, of which the first-mentioned one is the body and incloses the cylinder and its roller-bearings, and the others are the heads or ends. These parts are united by flange-joints a^2 a^2, and the heads are recessed at a^4 inside to take in the ends of the revolving cylinder. There are also openings a^5 through the ends for the piston-driving shaft and stuffing-boxes on the outside where the shaft passes through.

Above and below the line of the shaft are passages leading from the recess a^4 in each head outward through the top and the bottom sides, of which the passage A^6 below the line is the inlet or suction passage and the one A^7 above the line is the delivering or pressure side. The corresponding passages of the two heads are united by curved pipes C C*, to form a common inlet-pipe below the case and a common discharge-pipe above the case. The air or liquid is therefore taken and discharged at both ends or sides of the case.

The piston B is set eccentrically within the cylinder D, that fits closely into the space between the two heads, but is free to revolve with the piston, this movement being produced by the contact and pressure of the wings B′ B′ against the interior face of the cylinder. These wings are curved plates attached at one edge or side to the piston-block *b* by a hinge-joint, b^2 b^2, to open outward as well as to close down against the block, but having such breadth of face that they bear against the cylinder at all times during movements and under all positions of eccentricity of the block. Each plate forms a partition extending from piston-block to cylinder, and the whole number divides the space between cylinder and block into compartments which under the rotary movement become reduced in area at one side of the axis and increase in area as they pass around to the opposite side. These plates B′ and the block *b* form the piston. The face of the block has recessed portions *b*′, into which the plates fit closely when shut, and intermediate strips, b^3, standing above the seats *b*′, have the plates attached to them by hinge-joints b^2. A simple form of hinge for this joint is given in the drawings. It is produced by making a tubular groove along the top face of the standing strip and shaping the edge of the plate to fit and work in it. This edge, being slipped into the groove from the end of the block, is confined by a strip or plate, *e*, screwed to the face of the block to overlap the groove. Figs. 4 and 5 show this construction plainly.

In that part of the stationary case above the piston-chamber are two cylindrical spaces, E E, situated on opposite sides of the center of the piston-chamber and opening into it, as well as into each other. Each of these spaces contains a pair of broad-faced wheels or rollers, F F, that are fast on an axle, *f*, and within a broad ring or cylinder, *g*, fixed in the space between the two wheels, are anti-friction rolls f^2 f^2, set around the axle *f*. This cylinder is slipped into the case from one end, and as it fits closely into the space E it remains in position and supports the axle-bearings between the two

wheels. By removing the part A of the case from between the heads A′ the rollers and wheels are drawn out with it, and are readily reached for cleaning or repairing the parts. The wheels are placed in this manner over and on opposite sides of the center of the revolving cylinder D for the purpose of keeping it in position, as otherwise, without some controlling means to counteract the centrifugal force during revolution, the cylinder would be thrown out of position and strike against the side of the stationary case. That portion of the cylinder D against which the wheels run is re-enforced with a band or part, *d*, of greater thickness than the shell of the cylinder.

As thus constructed and arranged these parts operate as follows: Power being applied to the shaft H, the piston rotates within the case and carries around with it the cylinder D in the direction of the arrow, Figs. 2 and 4. This movement brings the spaces D* D* between the piston-wings into line with the openings A^6 A^7 in the heads in successive order, first with the suction side below the axis of rotation, and then with the discharge or pressure side above the axis. By virtue of the eccentric position of the piston-block in the surrounding cylinder also, the spaces increase in area as the wings unfold below the axis, and after passing the center their area is rapidly reduced as the wings shut down into the recesses of the block.

It will be evident, of course, that by connecting the pressure side of this pump with any suitable power, as air, steam, or gases under pressure, the piston may be caused to drive the shaft, and a rotary engine can be produced.

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

1. In a rotary pump, the combination of a stationary case, the cylindrical chamber, piston and piston-shaft placed eccentrically in the chamber, suction and pressure openings and passages A^6 A^7 above and below the line of the piston-shaft, and the loose cylinder D, concentric with the main case and eccentric to and inclosing the piston and free to revolve with it, substantially as described.

2. In a rotary pump, the combination, with a rotating piston having folding wings or partitions and set eccentrically in a cylindrical chamber, as described, of a loose revolving ring or cylinder concentric with the main case or piston-chamber, and eccentric to and inclosing the piston, and guide wheels or rollers that control the cylinder and keep it in position during its revolutions, substantially as described.

3. In a rotary pump, a piston having hinged wings that open out from the piston-block and shut against it, and a loose ring or cylinder surrounding the piston, in combination with a cylindrical piston-chamber, within which the piston is set to rotate eccentrically, and the ring or cylinder concentrically, the said chamber having ports or passages of inlet and discharge leading in and out from the ends of the cylinder, substantially as described.

4. In a rotary pump, a stationary piston-chamber having bearings a^5 for a longitudinal eccentrically-set shaft, H, in the ends, and suction and discharge ports and passages above and below, or on opposite sides of said shaft-bearings, in combination with the piston, and a revolving ring or cylinder which is interposed between the walls of the chamber and the piston and is eccentric to, incloses, and turns with the piston, but concentric with the axis of the chamber.

5. In a rotary pump, a stationary piston-chamber having a loose internal cylinder inclosing the piston and set concentric with the piston-chamber and eccentric to the piston, in combination with said piston, and with roller-chambers E E, and guide wheels or rollers F F, held in chambers E E over the loose cylinder, as set forth.

6. The pump-case having cylindrical piston-chamber and roller chambers or spaces over it on opposite sides of the center thereof, in which are roller-bearings g f^2 and spaces for the rollers, as described.

7. The herein-described pump, consisting of the stationary case having piston-chamber, roller spaces or chambers E E above and on opposite sides of the center of the chamber, the inlet and discharge ports and passages leading into and from the ends of the piston-chamber, the eccentrically-set piston, concentric cylinder D, and guide wheels or rollers F F, combined for operation as set forth.

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