

(No Model.)

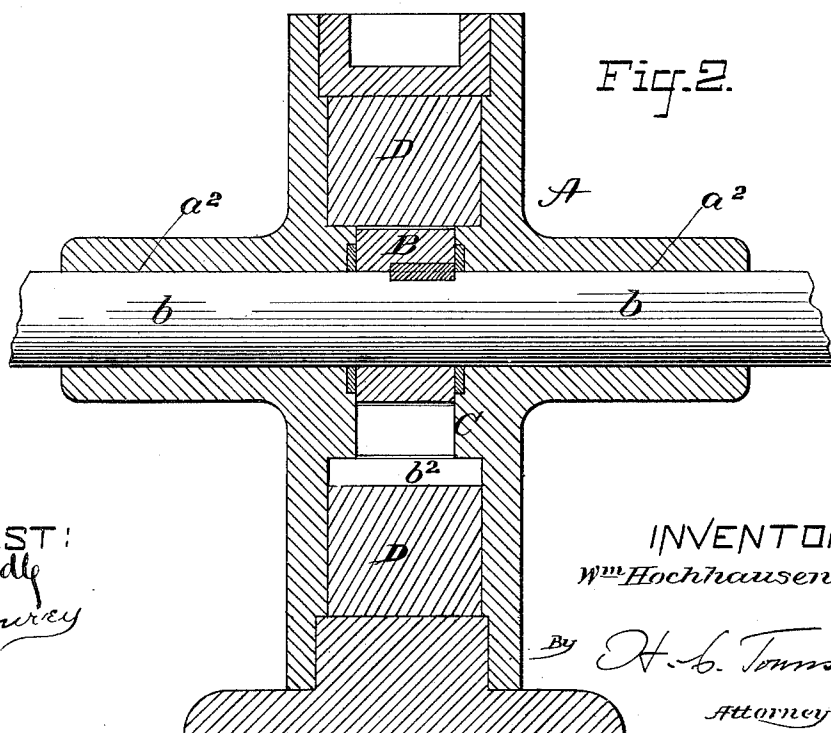
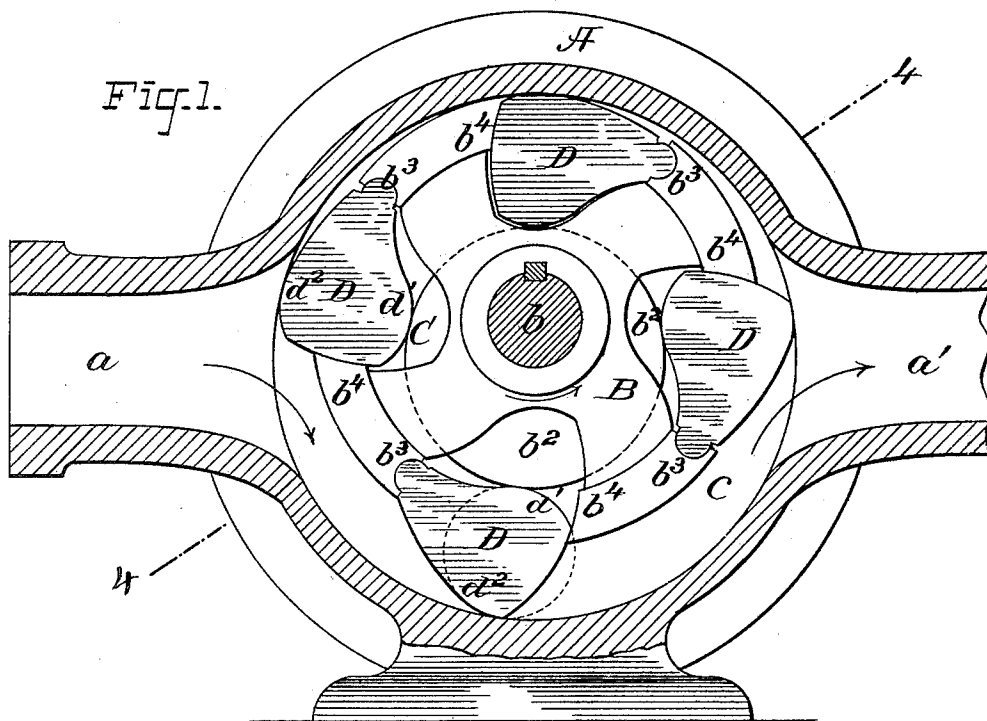
W. HOCHHAUSEN.

2 Sheets—Sheet 1.

ROTARY PUMP.

No. 462,708.

Patented Nov. 10, 1891.



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(No Model.)

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ROTARY PUMP.

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Fig. 3.

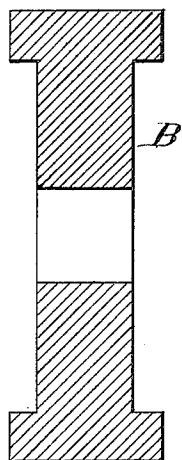
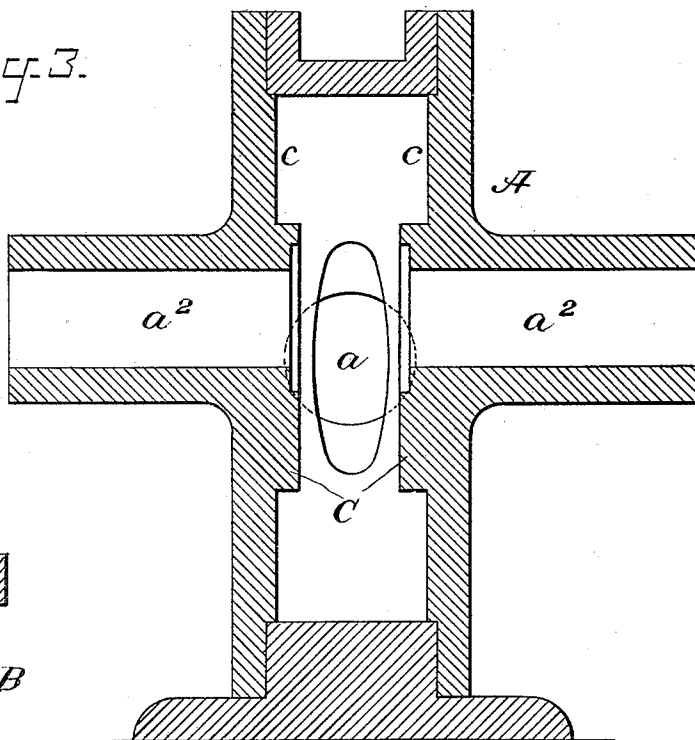
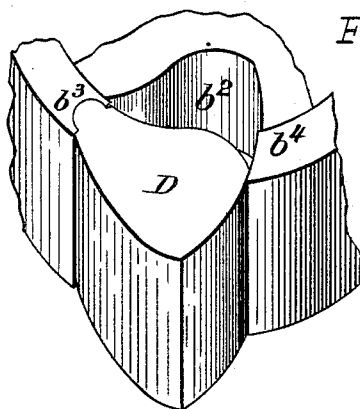


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM HOCHHAUSEN, OF BROOKLYN, NEW YORK.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 462,708, dated November 10, 1891.

Application filed November 10, 1890. Serial No. 370,992. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HOCHHAUSEN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Rotary Pumps, of which the following is a specification.

My invention relates to that class of rotary pumps in which a series of pivoted or hinged pistons or vanes in a revolving drum are alternately forced outwardly and inwardly during the rotation of the drum.

The object of my invention is to obviate as much as possible the friction and binding action which constitutes an objectionable feature in the machines of this type heretofore made.

It is also my object to make the construction of the parts as simple as consistent with effective operation, and to make the vanes readily removable and at the same time not liable to be deranged when in operative position.

For this purpose the machine embodying my invention consists, essentially, in a cylindrical casing, preferably having an annular groove in one or both of its side walls, and a revolving recessed drum eccentrically journaled in said casing and provided with a number of vanes or wings, or pistons, loosely pivoted therein and adapted to be moved in and out of the recesses by forward side extensions from said wings, as hereinafter more particularly described and claimed.

My invention consists, also, in such further features as will be set forth below, and pointed out in the claims.

In the drawings accompanying this specification, Figure 1 represents a vertical longitudinal section of a rotary pump embodying my invention; Fig. 2, a vertical transverse section of the same; Fig. 3, a similar section of the pump-casing with the revolving drum removed. Fig. 4 is a transverse section on the line 4 4 of the drum with the vanes removed, and Fig. 5 an isometric view of a portion of the drum with the vanes in position.

In the drawings, A represents the cylindrical casing provided with the usual inlet and outlet a and a' and the eccentric bearings a^2 for the journals of the revolving drum B. It will be noted that the side walls of the

casing are provided on their inner sides with two cams, preferably in the shape of circular and disk shaped bosses C C, which are concentric with the cylindrical wall of the casing, and hence eccentric with the bearings a^2 . An annular groove c is thus formed in each side wall of the casing, in which the vanes to be hereinafter described are guided. The revolving drum B is eccentrically mounted in the casing A by having its journals $b b$ pass through the eccentric bearings a^2 in the usual way. The said drum is provided with the recesses b^2 , affording the necessary play to the vanes D, to be described below, and the circumferential flanges or enlargements adapted to extend entirely across the enlarged space in the casing formed by the annular grooves c . In the recesses b^2 are pivotally arranged the vanes or wings D, which extend entirely across the enlarged portion of the casing and are guided in their movements by the annular grooves C, as shown best in Figs. 1 and 2. It is in the peculiar construction and arrangement of these vanes that the principal part of my invention resides, and I will therefore describe the same more fully. It will be noticed that these vanes consist of an enlarged forward portion and a reduced circular rear or pivotal portion. They are loosely pivoted or fulcrumed in the drum, which is provided near the rear entrance of each recess with a small cylindrical bearing or pivot b^3 , which, in conjunction with the forward faces b^4 of the recesses and the grooves C, serves to hold the vanes in position and yet permit of their oscillating motion, and, if desired, the removal of the vanes when one of the walls of the casing is removed. It will be noted, moreover, that the forward or pressure face d of each vane is on the arc of a cylinder concentric with the pivot or bearing b^3 . By this arrangement and form of the pressure-face d all back pressure occurring in the pump is transmitted along radial lines running from the pivotal point of the vanes, according to well-known mechanical principles. It is manifest, therefore, that under this construction all binding action of the vanes against the cylindrical walls of the casing or the bosses due to back-pressure is avoided and a great source of friction in these parts removed. As shown, it is preferable to make the forward

faces b^4 of the recesses b^2 arcs of the same circle as the pressure-faces, so that the latter will fit snugly against the former in their various positions and will be accurately held in place. The forward portions of the side faces d' and d^2 of these vanes, as indicated by the dotted circle in Fig. 1, are arcs of a cylinder whose diameter is equal to the width of the annular groove c . This arrangement of these faces serves the double purpose of converting a portion of the motion of these vanes into a rocking motion on the sides of the groove c , thus reducing the friction, and also of causing the forward portion of the vanes to fit accurately in the groove in all their positions, thus preventing leakage.

The operation of my improved pump will be readily understood from the above description. As the drum B revolves each vane in turn in traveling past the inlet a from its uppermost to its lowermost position is forced out of its recess b^2 in the drum by reason of the eccentricity of the groove c , in which it is located. When it has passed the inlet, the water in the lower part of the casing is prevented from returning and is swept by the vane into the outlet a' . The vane then gradually recedes into its recess until it reaches the top of the casing, when the above operation is repeated. By reason of the peculiar shape of the front pressure-faces d of the vanes the back-pressure of the water is prevented from causing the said vanes to bind against the walls of the casing A, and the cylindrical portions of the side faces d' and d^2 tend to reduce the friction between these faces and the said casing and the inner sides of the groove c , for the reasons above explained. The friction in the pump is hence reduced to a minimum by my arrangement of vanes.

My arrangement of loosely pivoting the vanes reduces the cost of construction considerably, and also enables me, when one of the side walls of the casing has been removed, to readily slip the vanes out of the drum for purposes of repairing or when for any reason it becomes necessary or desirable to remove the vanes. At the same time these vanes, by reason of the forward faces of the recesses and the grooves c , are securely held in position, as if they were permanently pivoted or hinged. I consider this an essential feature of my invention.

It is manifest that the device shown in illustration of my invention may be modified in many particulars without departing from my invention. Thus, for example, instead of the two bosses C C, one such boss only might be employed, and instead of being circular these bosses might be cam-shaped. The form of the loose pivot might also be modified in various ways, and in general a great number of

changes might be effected in the device, as shown, consistently with the present invention. I do not, therefore, desire to limit myself to the specific construction shown; but

What I claim, and desire to secure by Letters Patent, is as follows:

1. In a rotary pump, the combination, with a casing having an annular groove or grooves and a rotary drum eccentrically journaled in the casing, of wings or vanes pivoted in the rotary drum, and the forward portions of whose side faces are arcs of a circle whose diameter is equal to the width of the annular groove, substantially as and for the purpose described.

2. In a rotary pump, the combination, with a casing and a cam-disk in the side wall thereof, of a rotary drum having recesses provided at their rear entrance with a pivotal bearing and having their forward faces in an arc of a cylinder concentric with the pivotal bearing, and a series of vanes each having a rear pivotal portion, and a forward pressure-face in the arc of a cylinder also concentric with the pivotal bearing, said vanes fitting loosely between the forward and rear face of the recesses and between the casing and its cam-disk, substantially as and for the purpose set forth.

3. In a rotary pump, the combination of a cylindrical casing having an annular groove in its side walls and eccentrically mounted, and a rotary drum provided with recesses whose rear faces are provided with pivotal bearings and whose forward faces are on the arcs of cylinders concentric with the pivotal bearings, with vanes fitting into the space between the front and rear faces of the recesses and extending and fitting into the said annular groove, substantially as and for the purpose set forth.

4. In a rotary pump, the combination with a casing having an annular cam-groove in its side wall, and a rotary drum eccentrically journaled in the casing and having recesses provided at their rear side with a pivotal bearing, of wings or vanes D, pivoted on said bearings and formed, as described, with a forward pressure-face in the arc of a circle concentric with the pivotal bearing, and having the forward portions of their side faces formed on arcs of a circle whose diameter is equal to the width of the cam-groove, as and for the purpose described.

Signed at New York, in the county of New York and State of New York, this 25th day of October, A. D. 1890.

WILLIAM HOCHHAUSEN.

Witnesses:

THOS. F. COUREY,
WM. H. CAPEL.