

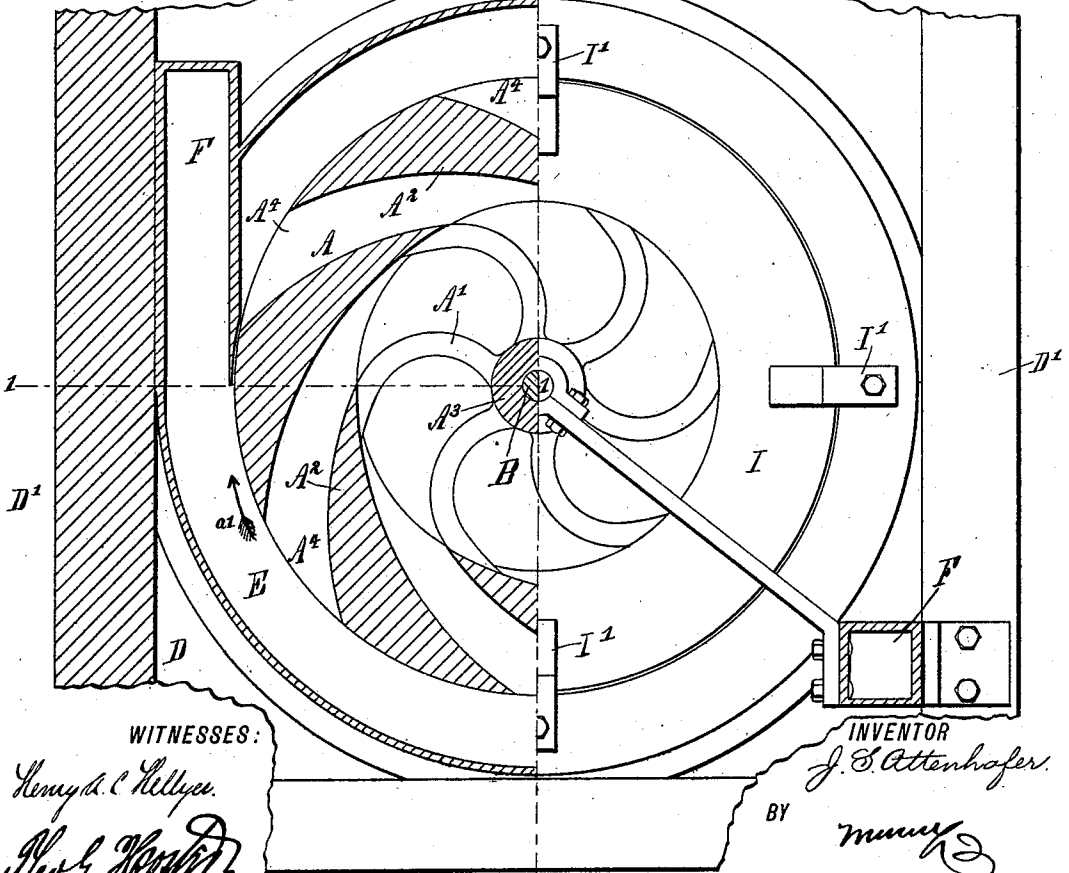
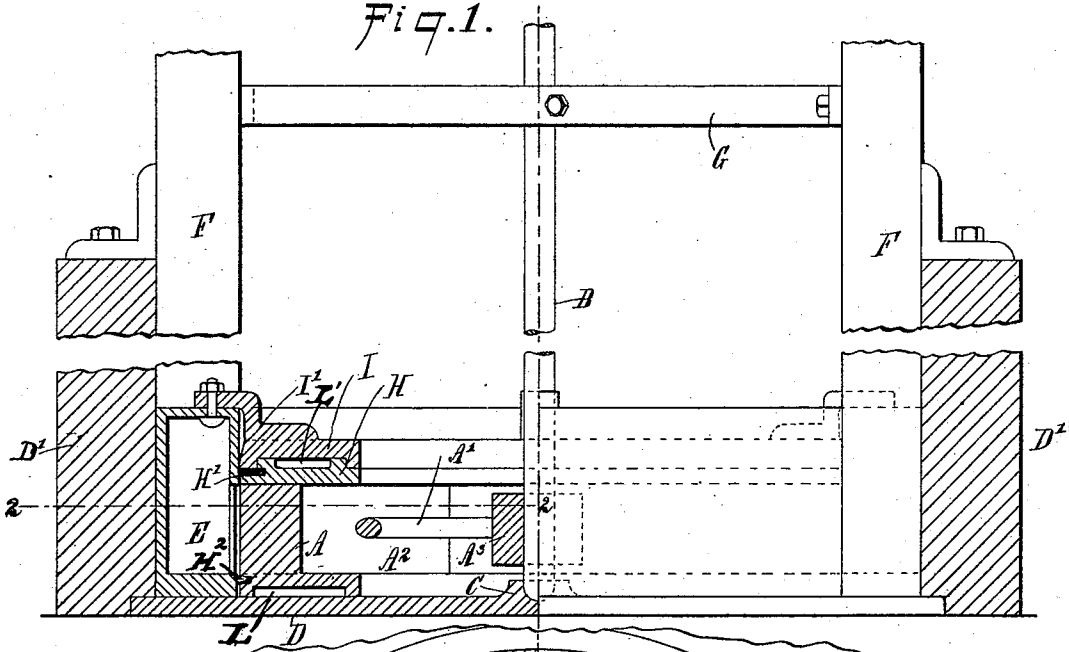
(No Model.)

J. S. ATTENHOFER.
ROTARY PUMP.

No. 578,132.

Patented Mar. 2, 1897.

Fig. 1.



WITNESSES:

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Fig. 2.

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ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 578,132, dated March 2, 1897.

Application filed May 16, 1896. Serial No. 591,754. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEPHEN ATTENHOFER, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a full, clear, and exact description.

My invention relates to improvements in rotary pumps, and has for its objects to simplify and cheapen the cost of construction, to make them more efficient in use, and less liable to be interfered with by sand and silt in the water.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is an elevation of my device, partially in section, on the line 1 1 of Fig. 2; and Fig. 2 is a plan view, being partially in section, on the line 2 2 of Fig. 1.

Springing from the central hub A^3 of the wheel are a series of curved spokes A' . Upon the outer end of these spokes and formed as a part thereof are the curved buckets A^2 . The curves of these buckets are made such that the center line of the spaces between them will correspond as nearly as possible to the path assumed by any particle when revolved at the working speed of the pumps. The passages A^4 are substantially equal in cross-section at all points. The wheel has an annular plate H, which covers the sides of the buckets and the annular space within which the buckets lie. A corresponding plate for the other side may be cast as a part of the buckets or may be detachable at will. In the drawings it is shown as forming part of the buckets. Each of these annular plates has upon its outer sides recessed annular spaces L L' . The one upon the lower side L is formed by projecting annular flanges upon the outer edges of the plate. The one, L' , upon the upper plate H is formed by similar projecting flanges, but they are set back a short distance from the edges of the plates.

The center of the wheel, it will be seen, is entirely open within the annular spaces occupied by the buckets, excepting for the spokes A' . The lower end of the shaft B is supported in a bearing C upon the bar D. This bar D is connected to the frame and is

comparatively narrow, occupying but a small portion of the open space at the center of the wheel. Surrounding the periphery of the wheel is a discharge-casing E. This casing has one or more discharge-pipes F rising therefrom. Attached to this casing is an annular plate I. This plate I has downwardly-depending flanges at its outer and inner edges, fitting outside the upwardly-projecting flanges upon the plate H. They do not come close enough to them, however, to make serious friction. When the wheel is in place, there is thus formed the annular air-space L' , previously mentioned. The downwardly-projecting flanges on the plate I form a pocket to prevent the air from escaping beyond them, and consequently there will be a thin layer of air in the space L' . The space L upon the lower side of the wheel will for the same reason always have a layer of air within. The bar D is made as an annular plate upon the under side of the bucket portion of the wheel.

In the periphery of the wheel are formed two grooves H' and H^2 , and in these grooves are placed rings which bear against smoothed surfaces upon the casing E. The object of this is to prevent water from leaking by the outer edge of the wheel and toward the center. It is liable to do so unless packing is inserted, as the pressure of water in the casing E is greater than the pressure surrounding the wheel and in the center thereof. The object of the annular spaces L and L' is to retain a small portion of air therein, and in so doing reduce the friction between the wheel and the casing. With a layer of air between the wheel and the fixed annular plates there will be less friction between the same when the wheel is revolved than if these spaces were filled with water or the two were in direct contact. There may be some water in each of these spaces, but there will always be a thin layer of air upon the top of the water and between the water and the casing-ring or the wheel. As a consequence the friction will be much less than it would otherwise be. In consequence of this the power required to drive the wheel will be much less than with other forms of construction. The packing-rings H' and H^2 will also prevent leakage by the edge of the wheel and will result in a greater discharge for the same speed.

The casing of the annular bucket portion of the wheel above and below prevents the friction due to the contact of the revolving portions of the wheel with the surrounding water which would occur were they not so inclosed. The center of the wheel being open, as described, and all the frictional surfaces being covered, its working will not be disturbed by resting in water containing considerable sediment. There is no chance for sediment to be deposited upon any friction-surface. As a consequence the wheel may be started even if there is a heavy deposit of sediment in the same. In fact, it may be started and run even if entirely buried in the sand. The wheel is designed, however, to be suspended in the water and not to rest upon the bottom unless it is to be used for pumping sand.

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

1. In a centrifugal pump, the combination of a wheel consisting of buckets arranged within a horizontal annular space surrounding the center, spokes connecting the said buckets with a central hub, annular plates fixed to the sides of said buckets, both of said plates having a recessed ring in their outer sides, the recess being formed by two projecting rings, with a discharge-casing surrounding the periphery of the wheel, and annular cover-plates attached thereto and covering the annular plates of the wheel, the upper of said fixed plates having projecting rings to go outside of the side projecting rings on the wheel-plate, substantially as described.

2. In a centrifugal pump, the combination of a revolving wheel consisting of two annular plates, having buckets between them and spokes connecting the same with the center, with a discharge-casing surrounding the periphery of the wheel and having plates attached thereto and inclosing the annular wheel-body, the adjacent surfaces of the annular wheel-body and inclosing plates having non-registering projecting annular flanges near their outer and inner edges, adapted to fit one within the other, substantially as described.

3. In a centrifugal pump, the combination of a revolving wheel having a central circular open space on each side thereof, spirally-curved spokes leading from the center to the outer rim of this open space, with a rim attached to the outer rims of the spokes consisting of two annular side rings and buckets between the same cast integral with and forming a continuation of the spokes, said buckets coming to a sharp edge at their inner end and thickening toward their outer end, forming passages between them of substantially equal cross-section, a casing surrounding the wheel and having one or more discharge-pipes leading therefrom, fixed annular plates attached to said casing and embracing the sides of the wheel, and packing-rings interposed between the periphery of the wheel and the surrounding casing, substantially as described.

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Witnesses:

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