

No. 721,207.

PATENTED FEB. 24, 1903.

J. B. C. LOCKWOOD.

ROTARY PUMP.

APPLICATION FILED AUG. 25, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

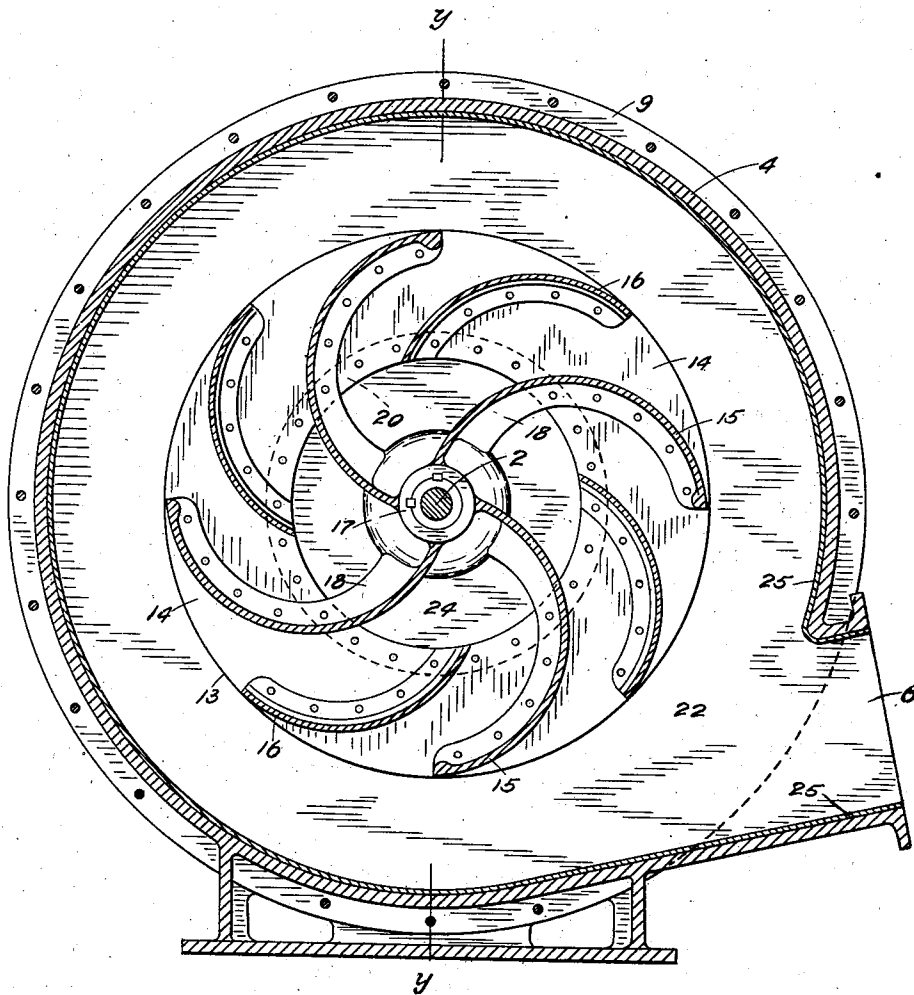


Fig. 1.

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2 SHEETS—SHEET 2.

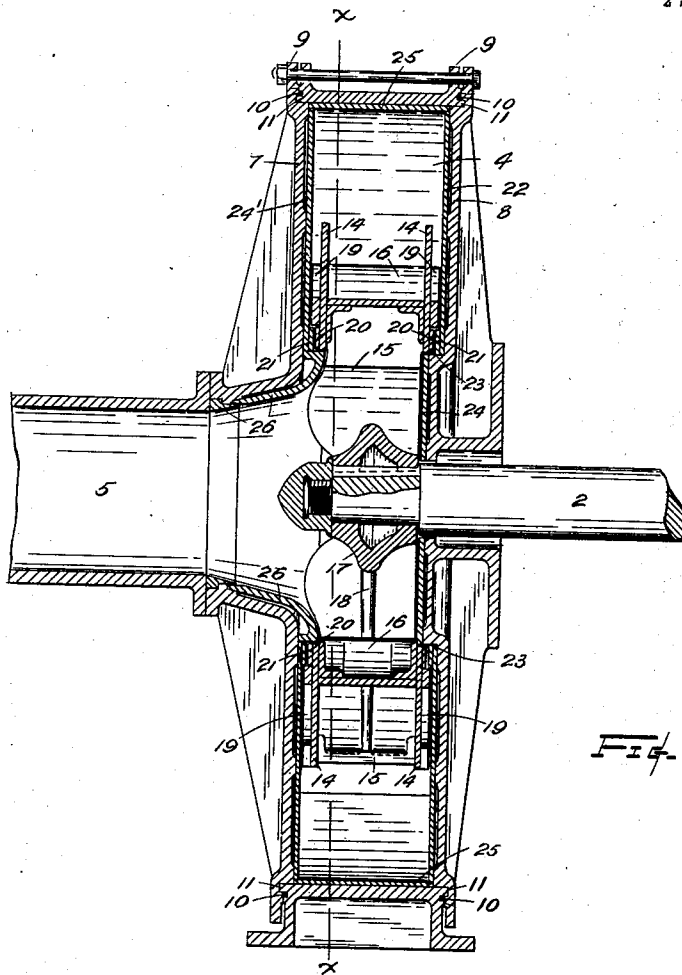


Fig. 2.

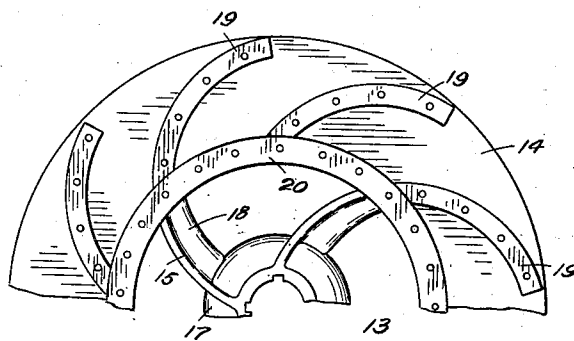


Fig. 3.

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JAMES B. C. LOCKWOOD, OF SEATTLE, WASHINGTON.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 721,207, dated February 24, 1903.

Application filed August 25, 1902. Serial No. 120,874. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. C. LOCKWOOD, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Rotary Pumps, of which the following is a specification, reference being had therein to the accompanying drawings.

15 This invention relates to improvements in rotary pumps, having special reference to that class of pump used for hydraulic dredging, wherein large quantities of water carrying rock, sand, and other gritty substances have to be handled.

The object of the invention is to prevent wear of the main casing of pump and to facilitate repairs, thereby making frequent renewals of pumps unnecessary, also maintaining approximately a maximum efficiency.

To these ends my invention consists in certain novel features of construction and combination of parts, which will be hereinafter described and claimed.

25 In the accompanying drawings, where similar figures of reference indicate corresponding parts in the three views, Figure 1 is a vertical transverse section of pump embodying my improvements, taken on line *x x* of Fig. 2. Fig. 2 is a vertical longitudinal section of same on line *y y* of Fig. 1. Fig. 3 is a front elevation of a portion of runner 13.

30 The driving-shaft 2 is so mounted in journal-bearings (not shown in drawings) as to be concentric of the containing-case 4, which containing-case has a central induction-opening 5 and a tangential orifice 6. It is preferable to make both heads or covers 7 and 8 detachable of the case for convenience of access. The case 4 is secured against distortion by the annular groove and corresponding tongue 11 and is packed by rubber gaskets fitting into annular grooves 10.

35 The pump-runner 13 is provided with two peripheral plate-rims 14, which form shrouds for a plurality of curved blades 15 16, secured therebetween, the alternate ones 15 continuing to the runner-hub 17 and are preferably made integral therewith, as are also the stiffening-ribs 18.

Secured to the external surface of each rim-plate are vanes 19, positioned opposite to

and of the same curvature, preferably, as the adjacent aforesaid shrouded blades or portions thereof. These vanes extend from the outer edge of peripheral plate-rims to rings 20 and 21, secured, respectively, in proximity to the inner edge of said rims and to liners attached to covers. As the runner rotates the vanes centrifugally expel any sand or other gritty substance which has a tendency to collect between the runner-shrouds and the covers. The said rings 20 and 21 are to prevent, so far as practicable, the passage of water and grit into the space occupied by the vanes 19; also, together with the said vanes to prevent any tendency to backflow or local circulation. In the event of the said rings becoming slightly worn the passage therebetween would not materially interfere with the pump's efficiency, as the leakage thereat would be from the axis outwardly on account of the flow created by the revolving vanes.

The cover 8 is made with a concentric shoulder 23 for the purpose of offsetting of spreading the cover-liner 22 and the adjacent shroud, so that the inner face of the latter will be in the same plane with the disk-liner 24 of head 8.

The opposite head 7 is protected from wear by a lining-piece 24', as is also the inner peripheral surface of the case by liner 25, which with the outer cover-liners 22 24' project into the discharge-orifice 6.

Lining-pieces 26, preferably made in two parts, as shown in Fig. 2, are provided for the induction-opening 5 to protect the same from wear. The inner part of the last-named liner extends in a curve interiorly of the pump to be flush or even with the inner face of the adjacent shroud of runner, while the other part is inserted from the outside and overlaps the first one. All of the aforementioned lining-pieces are so disposed as to provide unobstructed lead and discharge ways for the conveyed material and are detachably secured to the various parts of the case for which fitted by suitable bolts with inner countersunk heads and screw-nuts external of the shell, which are so arranged that they may be readily gotten at when it is desired to replace an individual piece.

The operation and advantages of the invention will be apparent from the foregoing description; but it may be mentioned that the

combination of the runner-shrouds whereby the axial thrust is overcome, together with other features of construction hereinbefore referred to, provides a dredging-pump far in
5 advance of any other which has come to my notice.

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

10 1. The herein-described pump, comprising a case having a central induction and a tangential discharge-opening; an annular shoulder upon the end opposite said induction-
15 opening; a runner concentric of said case and provided with tangentially-disposed curved blades; a shroud upon each of the opposite longitudinal ends of said blades; a ring se-
20 cured to the external surface of each shroud in proximity to its inner periphery; curved vanes extending from said rings to the outer periphery of said shrouds; liners covering the entire inner surfaces of said casing, said liners
25 comprising a peripheral casing-lining, a disk-lining upon surface opposite said induction-opening; a two-part liner for said opening, the inner part of said induction-lining and corresponding surface of said disk-lining be-
30 ing respectively even with inner surfaces of adjacent said runner-shrouds, a concentric liner upon each of said casing-covers and severally provided with a ring adjacent to their inner peripheries and contiguous with said rings of the shrouds; and the last-named
35 rings, substantially as and for the purposes set forth.

2. The combination with a case having a central induction and a tangential discharge-opening, a liner in said induction-opening projecting interiorly beyond the surface of
40 that end, and a liner upon the opposite end projecting inwardly from said end; of a run-

ner having curved blades and shrouds upon the opposite longitudinal ends of said blades so that the inner surfaces of said shrouds will be in the same plane respectively with
45 the inner end of the induction-liner and the said end liner, substantially as described.

3. The combination in a pump having central induction and tangential discharge open-
50 ings, a shrouded runner mounted on a driving-shaft concentric of the pump-case, of an annular shoulder on one of the covers of said case whereby the shroud of said runner projects longitudinally beyond the central por-
55 tion of the said cover or a liner attached there, to, substantially as set forth.

4. In combination with a pump having a central induction-opening and a tangential discharge-opening, a blade-shrouded runner concentric of the pump-case, of liner for said
60 induction-opening made in two overlapping parts respectively adapted to be inserted from the opposite sides of the casing-cover, the inner end of the said lining being in the same plane with the inner surface of the ad-
65 jacent runner-shroud, substantially as set forth.

5. The combination with the pump-casing provided with a concentric runner having curved blades, shrouds on longitudinal ends
70 of said blades, and liners upon the interior surfaces of said casing, of a pair of contiguous rings adjacent to the inner periphery of said shrouds, one of each pair of rings being
75 secured to the adjacent shroud and the other to the said liners, substantially as described.

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

JAMES B. C. LOCKWOOD.

Witnesses:

ALBERT E. GEBHARDT,
THOMAS C. TURLAY.