No. 795,595. PATENTED JULY 25, 1905.

L. P. ERICKSON.

CENTRIFUGAL PUMP.

APPLICATION FILED OCT. 11, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

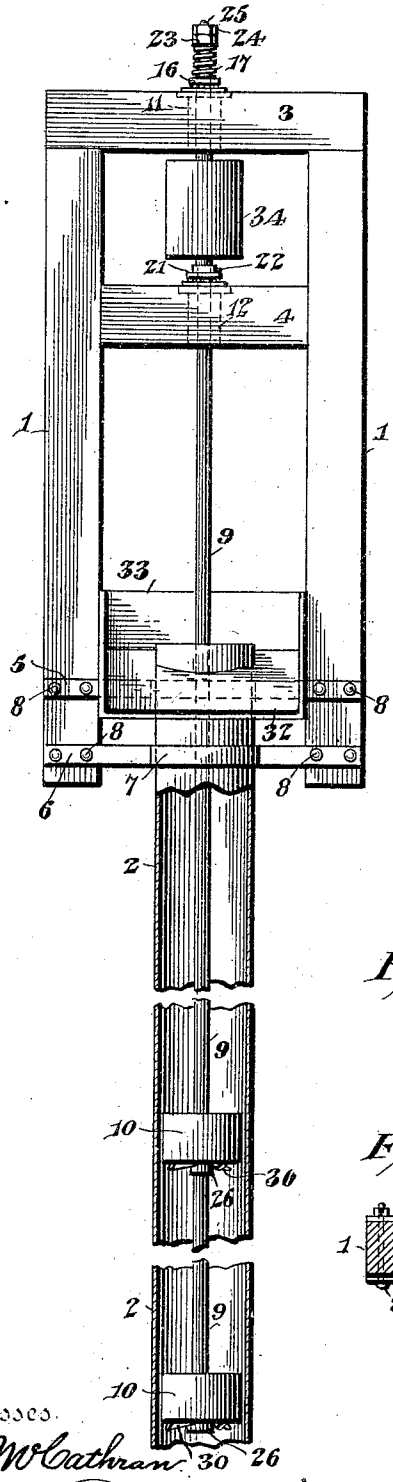


Fig. 2.

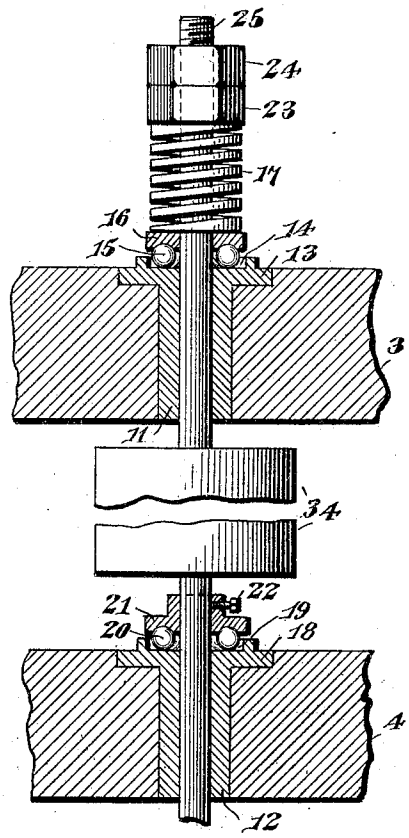


Fig. 3.

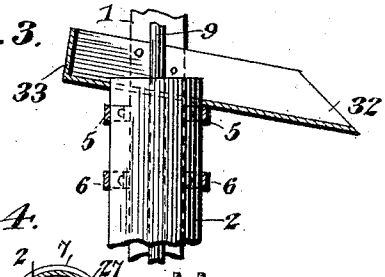
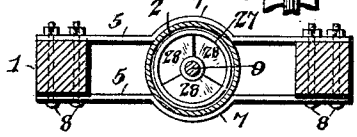


Fig. 4.



Witnesses.

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2 SHEETS—SHEET 2

Fig. 5.

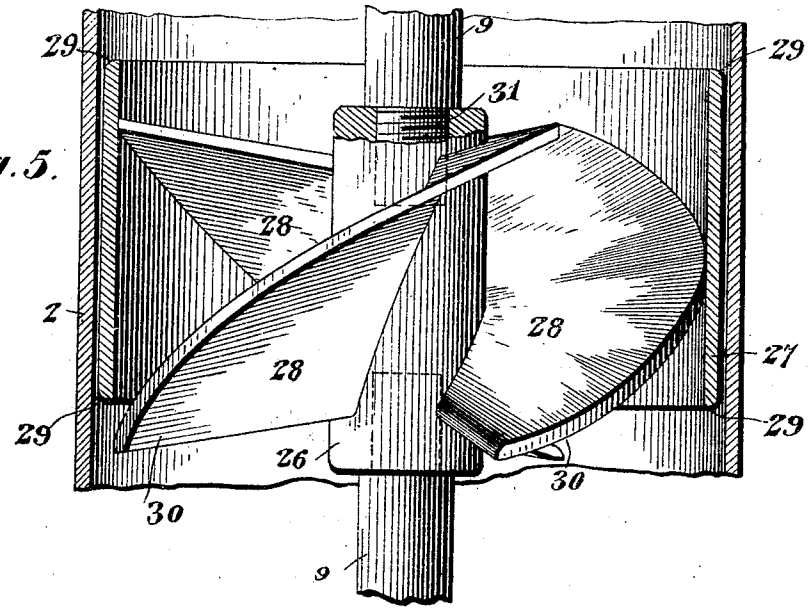
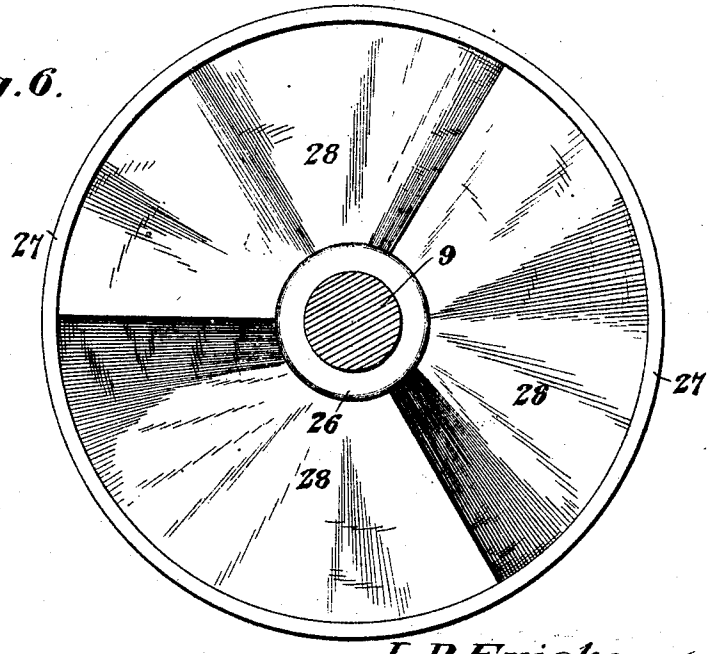


Fig. 6.



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UNITED STATES PATENT OFFICE.

LEWIS P. ERICKSON, OF JENNINGS, LOUISIANA, ASSIGNOR TO DOBBINS IRON WORKS, LIMITED, OF JENNINGS, LOUISIANA, A CORPORATION OF LOUISIANA.

CENTRIFUGAL PUMP.

No. 795,595. Specification of Letters Patent. Patented July 25, 1905.

Application filed October 11, 1904. Serial No. 228,052.

To all whom it may concern:

Be it known that I, LEWIS P. ERICKSON, a citizen of the United States, residing at Jennings, in the parish of Calcasieu and State of Louisiana, have invented a new and useful Centrifugal Pump, of which the following is a specification.

The invention relates to improvements in centrifugal pumps.

The object of the present invention is to improve the construction of centrifugal pumps, and to provide a simple and comparatively inexpensive one having an increased capacity and adapted to be operated with less po ver than heretofore.

A further object of the invention is to provide a pump of this character adapted to be readily mounted on a well-casing and capable of reducing the friction to a minimum.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation, partly in section, of a centrifugal pump constructed in accordance with this invention. Fig. 2 is an enlarged sectional view of the upper portion of the pump, illustrating the manner of supporting and journaling the vertical shaft. Fig. 3 is a detail view illustrating the manner of mounting the discharge-spout. Fig. 4 is a horizontal sectional view illustrating the manner of mounting the frame on the upper end of the well-casing. Figs. 5 and 6 are detail views of the centrifugal water-wheel.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 1 designate parallel vertical side bars or beams of an oblong supporting-frame which is mounted upon the upper end of a well-casing 2, as clearly illustrated in Fig. 1 of the drawings. The side bars 1 are connected at the top and at an intermediate point by cross-bars 3 and 4, the cross-bar 3 being secured to the upper ends of the side bars 1 and the other cross-bar 4 being interposed between the side bars at the upper portions thereof. The side bars and the upper cross-bars are preferably constructed of wood, and the lower portions of the side bars are connected by metal straps or bars 5 and 6, arranged in pairs and secured to the side bars at the opposite faces thereof. These metal straps or bars 5 and 6 are oppositely bowed at the center to provide curved portions 7 for embracing the well-casing. The ends of the metal bars or straps are perforated for the reception of bolts 8 or other suitable fastening devices, whereby the straps or bars are securely fastened to the sides of the frame and are firmly clamped on the well-casing.

The upper cross-bars 3 and 4 are pierced by the upper portion of the vertical shaft 9, which carries the rotary water-wheels 10, and the said cross-bars 3 and 4 are provided with bearing-sleeves 11 and 12, which extend entirely through the same, as clearly shown in Fig. 2. The upper sleeve 11 is provided at its top with a horizontal annular flange 13, seated in a recess of the cross-bar and provided with an annular groove or ball-race 14 for the reception of an annular series of antifriction-balls 15. The antifriction-balls 15 support a bearing-plate 16, provided at its lower face with an annular groove or race and engaged by a coiled cushioning-spring 17. The lower bearing-sleeve, which is constructed in a similar manner, is provided at its top with a flange 18, having a groove 19 for the reception of antifriction-balls 20, and the latter are engaged by a bearing-plate 21, which is secured to the shaft 9 by a clamping-screw 22 or other suitable means. The bearing-plate 21 is provided at its upper face with an extension or sleeve, on which is mounted the clamping-screw 22. The coiled cushioning-spring 17 is interposed between the upper bearing-plate 16 and an adjusting-nut 23, which is engaged by a jam-nut 24. The nuts are mounted on the upper end 25 of the shaft, which is threaded, as shown. The spring is adapted to equalize the pressure on the bearings of the cross-bars 3 and 4, whereby the friction is reduced to a minimum.

One or more of the rotary water-wheels may be employed, and each of the rotary water-wheels comprises an inner vertical hub 26, an outer cylindrical rim 27, and a plurality of

spirally-arranged blades 28. The cylindrical rim is of a diameter to fit snugly within the well-casing, there being a slight interspace between the two parts, as clearly shown in Fig. 5, and the upper and lower edges 29 of the rim are rounded, as shown. By this construction a water-cushion is formed around the rotary water-wheels, and it is unnecessary to step the lower end of the vertical shaft in a bearing or otherwise guide the same. This also reduces the friction of the pump to a minimum.

The rim 27 extends slightly above the upper end of the hub, and the latter projects slightly below the lower edge of the rim. The blades have curved spirally-arranged inner and outer edges, which are secured, respectively, to the hub and to the rim. The inner edge of each blade extends from the upper portion of the hub to the lower portion thereof, and the lower portions 30 of the blades project below the lower edge of the rim, as clearly shown in Fig. 5. The advantage derived from this particular arrangement is that the extended portions of the blades start the water through the pump before the outside rim of the bucket engages and commences to rotate the water. The suction is greatly increased by extending the lower ends of the blades beyond the lower edge of the rim, and the water-wheel is enabled to lift a greater body of water in less time than it could were the blades terminated at the lower edge of the rim. The hub is interiorly threaded to receive the reduced threaded ends 31 of the sections of the vertical shaft. In the accompanying drawings two wheels are shown, and the hub of the upper wheel serves as a coupling for the upper and lower sections of the shaft.

When the shaft is rotated, the wheels will operate to throw the water upward, as will be readily apparent, and the upper end of the well-casing is open and extends into the bottom of an inclined spout 32, thereby obviating the necessity of forcing the water through a lateral opening. By this arrangement the capacity of the pump is greatly increased and less power is required for operating it than similar pumps having lateral discharge-apertures. The spout, which is mounted between the side bars, is provided with an inclined bottom, and it has opposite sides which are secured to the inner faces of the side bars, as indicated in Fig. 3 of the drawings. The spout is provided at its upper end with a wall 33, and its lower end is designed to empty into a suitable tank or reservoir. The discharge-spout may be arranged in any desired manner with relation to the reservoir or other receptacle for the water.

The vertical shaft is provided between the cross-bars 3 and 4 of the supporting-frame with a pulley 34, adapted to receive a drive-belt; but any other suitable means may be employed for rotating the vertical shaft.

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

1. In a pump of the class described, the combination with a well-casing, of a supporting-frame having vertical side bars and provided with transverse bars having parallel end portions arranged at opposite sides of the vertical bars, said transverse bars being also provided with intermediate curved portions embracing and clamping the well-casing, the latter being extended upward between the vertical side bars of the frame, a vertical shaft journaled on and supported by the frame, and a rotary water-wheel carried by the shaft and operating within the well-casing, substantially as described.

2. In a pump of the class described, the combination with a well-casing open at the top, a supporting-frame receiving the well-casing, a spout mounted in the frame and having an inclined bottom pierced by the well-casing, the latter being terminated short of the upper edges of the sides of the spout, and means for forcing water upward in the well-casing, substantially as described.

3. In a pump of the class described, the combination with a well-casing, a supporting-frame composed of vertical side bars and connecting-pieces, an inclined spout arranged within the frame and having its sides secured to the said vertical bars, said spout being located at the top of the well-casing and having its bottom pierced by the same, and means for forcing water upward in the well-casing, substantially as described.

4. In a pump of the class described, the combination of a well-casing, a supporting-frame mounted on the top thereof and connected thereto, a spout mounted within and connected to the frame and extending therefrom, said spout having an opening in its bottom to receive the upper end of the well-casing, and means for forcing water upward in the well-casing, substantially as described.

5. In a pump of the class described, the combination with a well-casing, of a vertical shaft, and a rotary water-wheel having blades and provided at its periphery with a cylindrical rim fitting within the well-casing and having a slight interspace between it and the said casing, whereby a water-cushion is formed, the said blades being extended below the cylindrical rim to start the water through the wheel before the rim operates to rotate the water, substantially as described.

6. In a pump of the class described, the combination with a well-casing, of a vertical shaft, and a water-wheel comprising an inner vertical hub, a cylindrical rim, and a plurality of spiral blades having inner and outer edges connected respectively with the hub and the rim, the lower ends of the blades being extended below the rim to start the water through the pump before the rim operates

to rotate the water, substantially as described.

7. In a pump of the class described, the combination with a well-casing, of a vertical shaft, and a water-wheel comprising an inner vertical hub, a cylindrical rim, and a plurality of spirally-arranged blades connected at their inner and outer edges with the hub and the rim, the lower edges of the blades being extended below the rim to start the water through the wheel before the rim operates to rotate the water, and the lower end of the hub being also projected below the rim for supporting the blades, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of witnesses.

LEWIS P. ERICKSON.

Witnesses:

J. B. COOPER,
C. G. MORTON,
N. S. CRAIG,
E. F. WALKER.