O. W. ALPHA.

PUMP.

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1,020,382.

Patented Mar. 12, 1912.

3 SHEETS—SHEET 1.

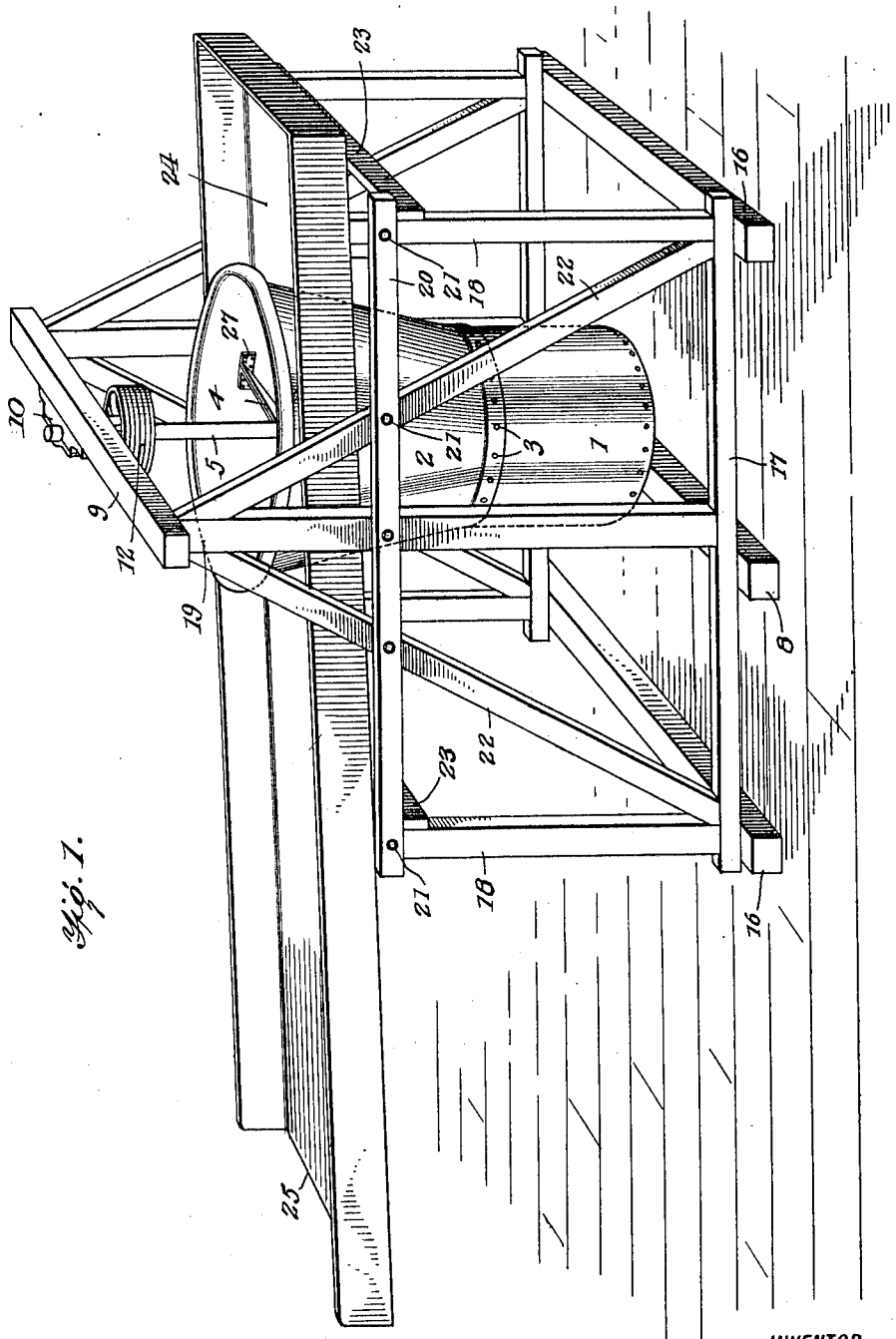

Fig. 1.

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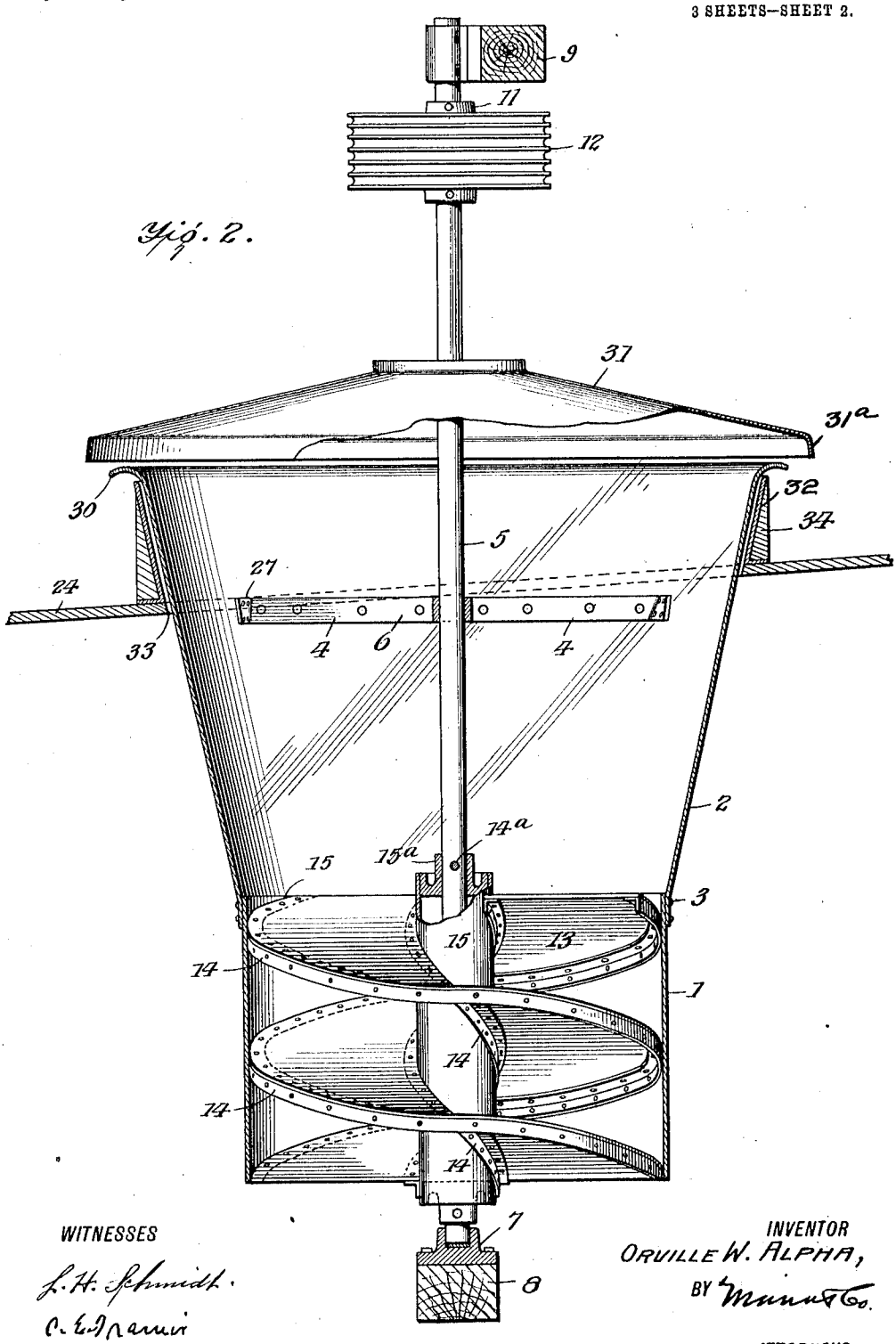
3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

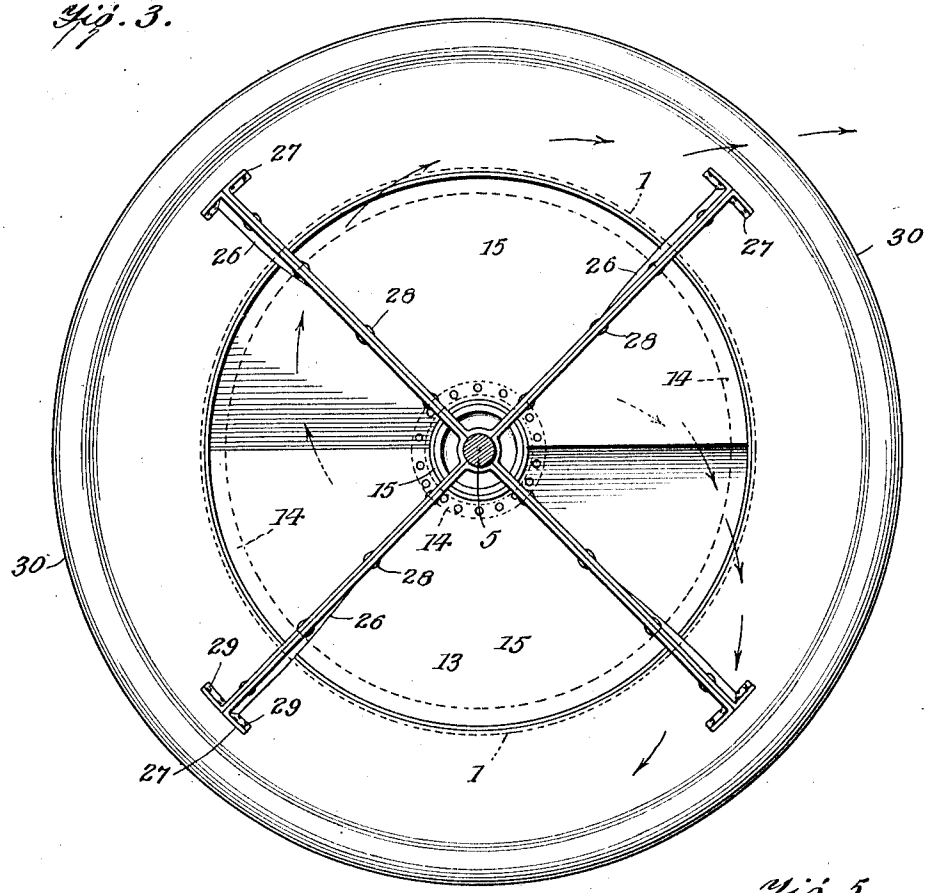

Fig. 5.

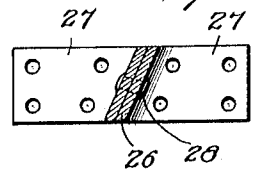

Fig. 4.

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UNITED STATES PATENT OFFICE.

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1,020,382. Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed September 25, 1909. Serial No. 519,548.

To all whom it may concern:

Be it known that I, ORVILLE W. ALPHA, a citizen of the United States, and a resident of Franklin, in the parish of St. Mary and State of Louisiana, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My invention is an improvement in pumps, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide an efficient pump of the rotary type, wherein the cylinder is caused to rotate at a high speed, the water being lifted by spiral wings or vanes, a portion of the distance, and by centrifugal force for the remainder.

Referring to the drawings forming a part hereof, Figure 1 is a perspective view of the improvement, the cover being removed. Fig. 2 is a vertical section of the cylinder. Fig. 3 is a plan view. Fig. 4 is a detail perspective view of one of the spider arms and Fig. 5 is a transverse section of the same.

The embodiment of the invention shown in the drawings, consists of a pump cylinder which is composed of a body portion 1, and a flaring upper end 2, which forms a mouth or outlet for the cylinder, and the said portions are secured together by rivets 3. The cylinder is provided in the flaring portion, and near the upper end thereof with a spider 4, and a shaft 5 is clamped in the spider, the shaft being arranged coaxial with the cylinder. The lower end of the shaft is journaled in a step bearing 7, on the cross bar 8 of a frame to be presently described, and the upper end is journaled in a bearing, 10, on a second cross bar 9 of the same frame; near its upper end, the shaft is provided with a pulley 11, having on the periphery thereof, a plurality of grooves 12, for receiving a belt or the like, to connect the shaft with a suitable source of power. The cylinder is also connected to the shaft by means of spiral vanes or blades 13, which extend from the lower end of the cylinder to the commencement of the flaring portion as shown in Fig. 2.

Each of the vanes is formed of a continuous sheet of material, having an angle plate 14 secured to each of the edges, one side of the plate being secured to the sheet. The other side of the plate on the outer edge is riveted, to the cylinder wall, while the other side of the plate on the inner edge is riveted to the face of a drum 15, having at each end a washer 15^a, encircling the shaft and pinned thereto by a pin 14^a.

The frame before mentioned, consists of two end cross bars 16, and a central bar 8, the ends of the bars being connected by rods 17. Uprights 18 and 19 are connected with the rods, the center upright 19 on each side extending above the end uprights 18, and the said center uprights are connected by the above mentioned upper cross bar 9. The uprights on each side of the frame are connected by the plates 20, which are secured thereto by bolts 21, and braces 22 are arranged between the upper ends of the uprights 19, and the lower ends of the adjacent uprights 18. The end uprights are also connected by cross plates 23.

The flaring upper end of the cylinder extends through an opening in a trough 24, which is supported by the frame, the trough having one end open as at 25, and being inclined downwardly toward the said end, as indicated in Fig. 1.

The spider is composed of a plurality of strips, each bent to form two portions 26, at right angles to each other, each having at its free end an angular portion 27, and at the junction of the portion a recess which coöperates with the recesses of the other strips to form the bearing 6. The strips are arranged as shown in Fig. 3, and the lapping portions of the strips are secured together by rivets 28, to form the arms of the spider 4, and the angular portions 27 are secured to the flaring part of the cylinder by rivets 29. As will be evident from an inspection of Figs. 3, 4 and 5 each of the spider arms is twisted on a longitudinal axis near its outer end.

The free edge of the flaring mouth of the cylinder is laterally flanged, as shown at 30 in Fig. 2, and a cover or hood 31 is arranged about the mouth, the edge of the hood extending outside of the flange 30, the hood being secured to the frame and trough and acting as a splash head. The hood is also spaced apart from the edge of the mouth to permit the free flow of water out of the cylinder and into the trough. The trough is provided with an annular flange 32, encircling the opening 33, through which

passes the cylinder, and the flange is reinforced by a collar 34, arranged outside of the flange. The lateral flange 30 of the flaring part of the pump extends over and beyond the flange 33 of the opening through the trough, and the edge of the hood or cover 31 extends beyond the lateral flange, and the said edge is provided with a downwardly projecting flange 31ª.

It will be understood that the portion 1 of the pump cylinder may be of any desired length, and that the vanes 13 extend from end to end of the same. When in use, the lower end of the cylinder dips into the water to be elevated.

In operation, the cylinder is rotated by means of the pulley 11, and the water is lifted by the spiral blades or vanes, and is passed upwardly into the flaring or frusto conical part, which may also be of any desired length. Owing to centrifugal force, the water tends to move outwardly, but is restrained by the wall of the cylinder. When however the flaring part of the cylinder is reached, while the direct outward movement is checked, the water is deflected, and tends to move upward at an angle to its original direction. It thus passes up the flaring side of the cylinder until it reaches the upper edge, when it passes out into the trough. It will be evident that the improved pump is more cheaply constructed than one with a continuous spiral, and requires no more power in its operation.

The fact that the flaring portion of the cylinder travels with the cylinder and the vanes, permits the pump to operate with less friction, than did it travel up a fixed surface.

It will be observed that in the improved pump, the liquid is drawn through the pump, and not through a separate casing, thus permitting the use of a shorter vane, and dispensing with the necessity of so much power.

I claim:

1. A pump comprising a substantially cylindrical casing having a flaring upper end, said end increasing gradually in cross section from its inner to its outer end, and having at said outer end an annular lateral flange, a shaft coaxial with the casing, a spider in the flaring portion in which the shaft is clamped, a drum on the lower end of the shaft, spiral blades between the drum and the inner face of the cylinder and encircling the drum, said blades extending upwardly to the commencement of the flaring portion, a frame in which the shaft is journaled, an inclined trough on the frame, and having an upwardly flanged opening through which the flaring portion of the casing extends, the lateral flange of said flaring portion extending beyond the flange, a cover for the cylinder above the upper end thereof, and extending beyond the lateral flange, and means for rotating the shaft.

2. A pump comprising a substantially cylindrical casing having a flaring upper end, said end increasing gradually in cross section from its inner to its outer end, and having at said outer end an annular lateral flange, a shaft coaxial with the casing, a spider in the flaring portion in which the shaft is clamped, a drum on the lower end of the shaft, spiral blades between the drum and the inner face of the cylinder and encircling the drum, said blades extending upwardly to the commencement of the flaring portion, means for supporting the shaft, a cover for the cylinder arranged above the upper end thereof, the cover being secured to the frame and trough, and extending beyond the lateral flange, and an inclined trough having an opening through which the casing extends, the opening being flanged around the opening, the lateral flange extending over the flange of the opening.

3. A pump comprising a substantially cylindrical casing having its upper end flaring, and provided with a lateral marginal flange, a shaft in the casing at the center thereof, spiral blades arranged between the lower end of the shaft and the lower end of the casing, and extending upwardly to the commencement of the flaring portion, a cover secured to the frame and trough above the casing, the edge of the cover extending beyond the lateral flange, a support for the shaft, a trough on the support having a flanged opening through which the casing extends, the lateral flange extending beyond the flange of the opening and means for rotating the shaft.

4. A pump comprising a substantially cylindrical casing having its upper end gradually increasing in cross section, and provided at its edge with a lateral marginal flange, spiral vanes in the lower end of the cylinder and extending upwardly to the commencement of the flaring portions, a cover above the casing and extending beyond the flange, a trough having an upwardly flanged opening through which passes the casing, and means for rotating the casing.

5. A pump comprising a substantially cylindrical casing having its upper end gradually increasing in cross section, and provided at its edge with a lateral marginal flange, spiral vanes in the lower end of the cylinder and extending upwardly to the commencement of the flaring portions, a cover above the casing and extending beyond the flange, an inclined trough having an opening through which the casing extends, and means for rotating the casing.

6. A pump comprising a substantially cy-

lindrical casing having a flaring upper end, said end increasing gradually in cross section, a cover spaced above the casing, a shaft coaxial with the casing and to which it is secured, a cover secured to the frame above the casing and spaced apart therefrom, spiral vanes in the lower part of the casing between the shaft and the inner wall thereof, and means for rotating the shaft.

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