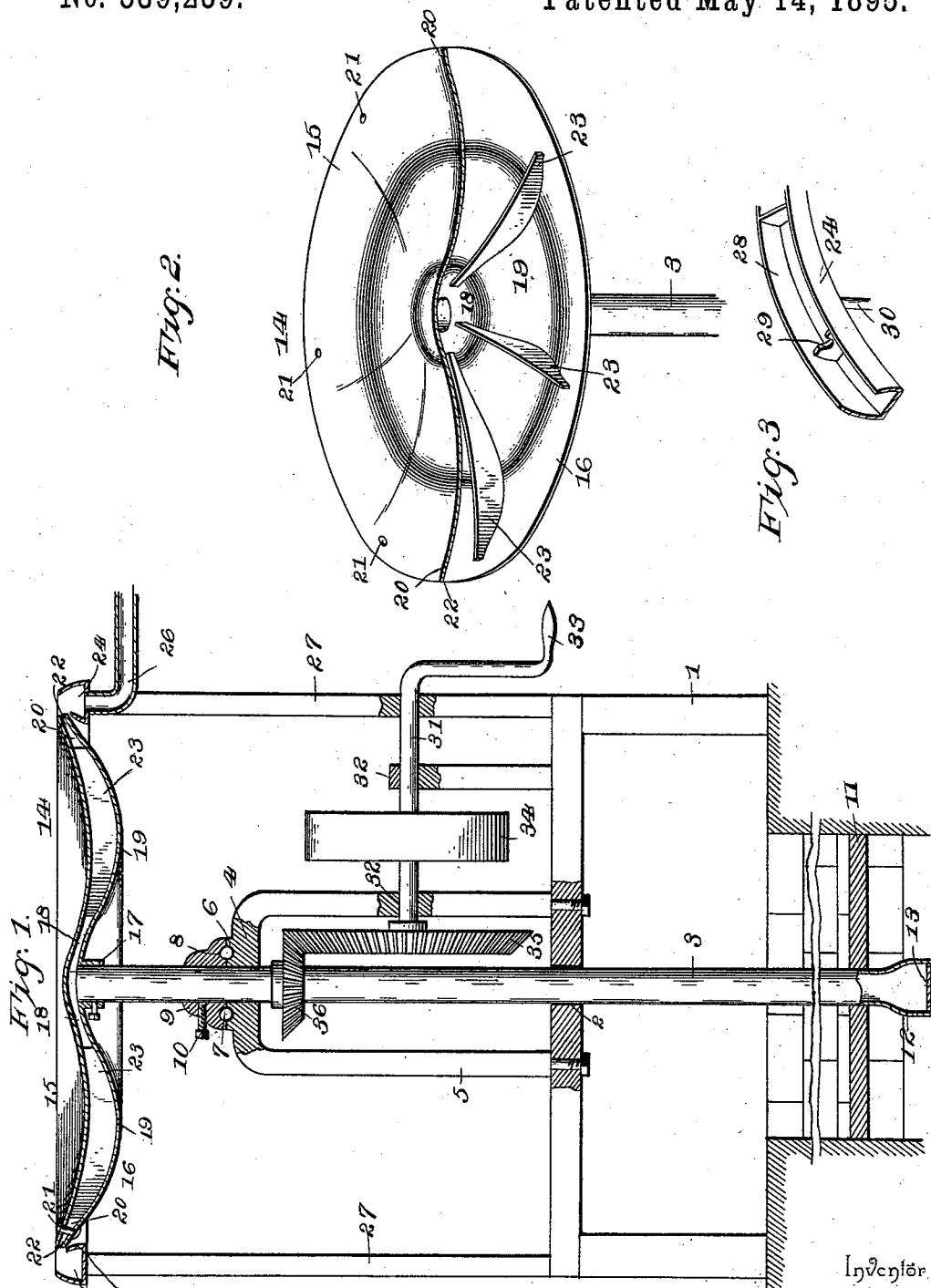


(No Model.)

S. D. SMITH.
CENTRIFUGAL WATER LIFT.

No. 539,239.

Patented May 14, 1895.



Witnesses

C. A. Ford.

S. D. Humphreys.

By his Attorneys.

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UNITED STATES PATENT OFFICE.

STEPHEN DECATUR SMITH, OF ORLANDO, FLORIDA.

CENTRIFUGAL WATER-LIFT.

SPECIFICATION forming part of Letters Patent No. 539,239, dated May 14, 1895.

Application filed March 31, 1894. Serial No. 505,906. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN DECATUR SMITH, a citizen of the United States, residing at Orlando, in the county of Orange and State of Florida, have invented a new and useful Centrifugal Water-Lift, of which the following is a specification.

This invention relates to centrifugal water lifts; and it has for its object to provide certain improvements in devices of that character that elevate or lift water by means of the suction created by the centrifugal discharge of the water.

To this end the main and primary object of the present invention is to provide a simple and efficient device of this character that shall have a very large capacity for lifting and discharging large quantities of water.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a central vertical sectional view of a centrifugal water-lift or pump constructed in accordance with this invention. Fig. 2 is a detail in perspective, partly in section, of the rotary hollow water-wheel. Fig. 3 is a detail in perspective of a portion of the circular trough.

Referring to the accompanying drawings, 1 designates the main supporting frame that is adapted to be arranged over a well or other water container from which water is to be lifted, and said main supporting frame 1, is provided with a central bearing opening 2, to receive the upright turning suction pipe 3, that also turns in the bearing collar 4, in the upper end of the upright bearing frame 5, secured on the frame 1. The collar 4, is provided in its top face with an annular recess 6, to receive a series of bearing balls 7, that work in a corresponding recess 8, in the lower face of the supporting collar 9, and is held fast on the suction pipe 3, by means of the set screw 10, to provide means for supporting the suction pipe for an easy turning within its bearings, and also for the vertical adjustment thereof if found necessary.

The upright turning or rotary suction pipe 3, is steadied near its lower end in a trans-

verse bearing bar 11, and has attached thereto the valve box 12, that is arranged to work or turn in the water and carries therein the inwardly opening valve 13, to admit the water into the pipe 3, and check the outflow of the water when the lift or pump is not running. The rotary suction pipe 3, supports in position on its upper end the horizontally arranged water wheel 14.

The horizontally arranged water wheel 14, is secured fast on the upper end of the pipe 3, and therefore rotates therewith, and said water wheel consists of the upper and lower spaced disks 15 and 16, respectively, the lower of which disks 16, is provided at its center with a hub or collar 17, to embrace the upper end of the pipe 3 and form the connection therewith. The said wheel disks 15 and 16 are arranged somewhat close together at the center of the wheel to form a contracted inlet passage 18, and concentric with the center or hub of the wheel the said disks are downwardly dished to form a widened water space 19, which provides a construction that places the bulk of the water away from and below the center of the wheel so that a greater centrifugal force will be secured by the discharge of the water.

The outer edges of the upper and lower wheel disks 15 and 16 are curved gently upwardly as at 20, and are secured together by suitable connecting means as at 21, to form the contracted circumferential or peripheral discharge opening 22, through which the water issues as it discharges from the wheel under the centrifugal action thereof. The said wheel disks are properly spaced apart by, and inclose therebetween, a series of radial partitions 23, that conform to the shape of said disks, to accelerate the discharge of the water, while at the same time forming checks to prevent the lateral flow of the water, said partitions not necessarily extending to the hub or the periphery of the wheel.

The water as it issues from the peripheral or circumferential discharge opening 22, of the wheel is discharged into a stationary circular water trough 24. The circular trough 24, entirely surrounds the hollow water wheel and is provided with a short inner inwardly curved wall 25, that is disposed directly under the outer edge of the lower wheel disk 16,

so that the water from the wheel will freely enter the said circular trough, and be carried to the point of the discharge pipe 26, connected to the trough at a suitable point.

5 The circular trough 25, is suitably supported on the frame 1, by the upright supports 27, and may be provided at a convenient point therein with a partitioned water reservoir 28, that constantly remains full of
10 water and has an overflow 29, into the main portion of the trough. A priming hose 30, is adapted to be suitably connected with the reservoir as shown in Fig. 3 to provide means for starting the operation of pumping or lifting
15 the water, said priming hose 30 being adapted to introduce water into any convenient part of the pump at a lower plane than the trough 24, as will be easily understood.

Motion may be communicated to the suction pipe 3, and the wheel carried thereby by
20 any suitable means and I have illustrated a suitably arranged operating shaft 31, mounted in suitable bearings 32, and provided with a hand crank 33, and a belt wheel 34, to provide for turning with either hand or motive
25 power, and on the inner end of said shaft is mounted the beveled gear wheel 35, that meshes with a similar wheel 36, mounted on the pipe 3.

30 Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a centrifugal pump, the combination of an upright rotary suction pipe, and a hollow water wheel mounted on the upper end
40 of said pipe and consisting of upper and lower imperforate wheel disks slightly separated at their edges and upwardly disposed at such edges to form a peripheral contracted discharge opening, said disks being also downwardly
45 dished at an intermediate point to form a widened water space, substantially as set forth.

2. In a centrifugal pump, the combination of a circular trough having a partitioned
50 priming-water reservoir, an upright rotary suction pipe, and a hollow water wheel mounted on the upper end of said pipe and consisting of upper and lower imperforate disks slightly separated at their edges to form a peripheral
55 discharge opening, discharging into said trough, and a series of radial partitions arranged between the disks, and terminating short of said peripheral discharge opening
60 substantially as set forth.

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

STEPHEN DECATUR SMITH.

Witnesses:

G. H. BACON,
L. G. STARBUCK.