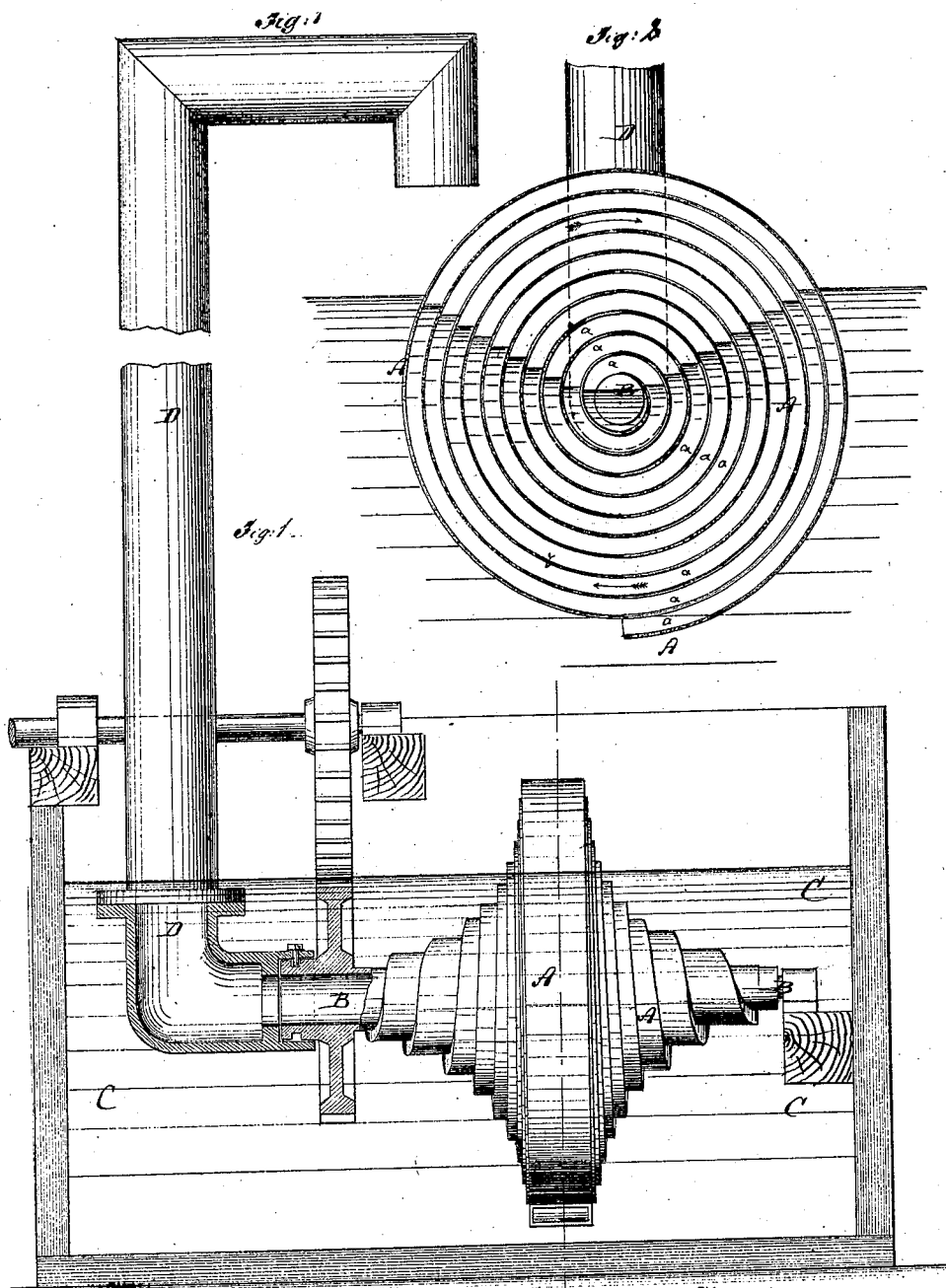


*B. Water,*

*Centrifugal Pump.*

*No. 107,426.*

*Patented Sept. 13. 1870.*



Witnesses:

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PER

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# United States Patent Office.

BERNHARD VATER, OF NEW YORK, N. Y.

Letters Patent No. 107,426, dated September 13, 1870.

## IMPROVEMENT IN WATER-ELEVATORS.

The Schedule referred to in these Letters Patent and making part of the same

*To all whom it may concern:*

Be it known that I, BERNHARD VATER, of the city of New York, in the county and State of New York, have invented a new and improved Water-Elevator; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 represents a side elevation, partly in section, of my improved water-elevator.

Figure 2 is a transverse section through the spiral wheel.

Similar letters of reference indicate corresponding parts.

The invention consists in so constructing the spiral wheel that the convolutions of the same shall gradually or successively diminish in width or capacity for containing air and water, from the central shaft outward.

The object of this peculiar construction is to adapt the wheel to elevate a greater quantity of water, since the cubical capacity of each separate convolution is to be equal to every other.

A in the drawing represents a spiral wheel, mounted upon a tubular axle, B, which has its bearings in a suitable frame, C.

The wheel B is made to constitute one continuous spiral channel, *a*, by being provided with a continuous partition, *b*, as shown in fig. 2.

The drawing represents a wheel with twelve convolutions. This number can be increased or diminished at pleasure. The convolutions become broader toward the center of the wheel, as indicated in fig. 1, so that those of lesser diameter will be able to contain the same amount of liquid as the others.

One end of the axle B is closed. The other end communicates with the discharge-pipe D, which may be placed vertically, horizontally, or in any other suitable position.

The outer end of the channel *a* is open, and constitutes a bucket for taking up the water or other liquid. Rotary motion, in the direction of the arrows, fig. 2,

is then imparted to the axle and wheel by suitable mechanism.

The wheel is to about two-thirds of its height immersed in the liquid which is to be conveyed. As it is revolved, the wheel will gradually convey the liquid toward its center, but in each convolution of the spiral, the liquid will stand only proportionately at the same height to which the wheel is immersed. There will, consequently, be an air-space left in the upper part of each convolution, as is clearly shown in fig. 2, and each convolution, owing to the difference in width, will contain as much water and air as each of the others.

As the wheel is being revolved, its open end will, during two-thirds of each revolution, take up liquid and force it into the channel, expelling thereby an equal amount from the central convolution in the axle and discharge-pipe. The remaining one-third revolution causes a similar displacement of air. The column of liquid in the discharge-pipe alone will, with its weight, tend to counteract the action of the wheel, while the liquid within the wheel, bearing with its weight toward the center, will exert a constant pressure in the direction in which the liquid is to be conveyed.

If the wheel would be entirely immersed in the liquid it would not operate, as the pressure against the air-chambers, which causes the successive motions of the columns of liquid, would cease.

The joint between the end of the rotary axle and the discharge-pipe is nicely packed, to be water-tight.

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

The improved wheel A, consisting of a continuous spiral, whose several convolutions are made successively wider from the periphery inward to the shaft B and in planes parallel to said shaft, substantially as herein shown and described, and for the purpose specified.

Witnesses:

BERNHARD VATER.

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