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THOMAS J. LOVEGROVE.
Water Elevator.

No. 121,637.

Patented Dec. 5, 1871.

Fig. 1.

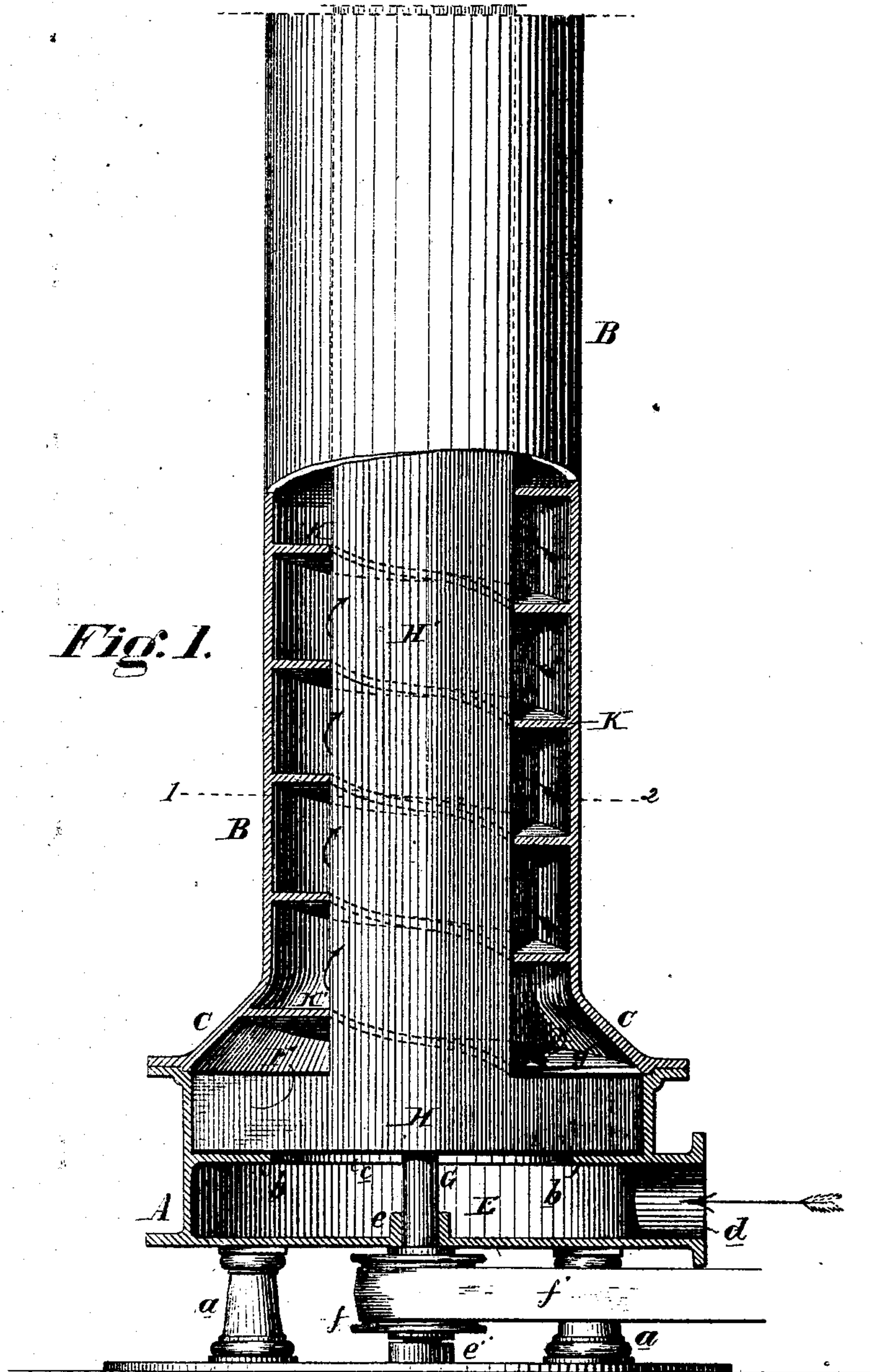
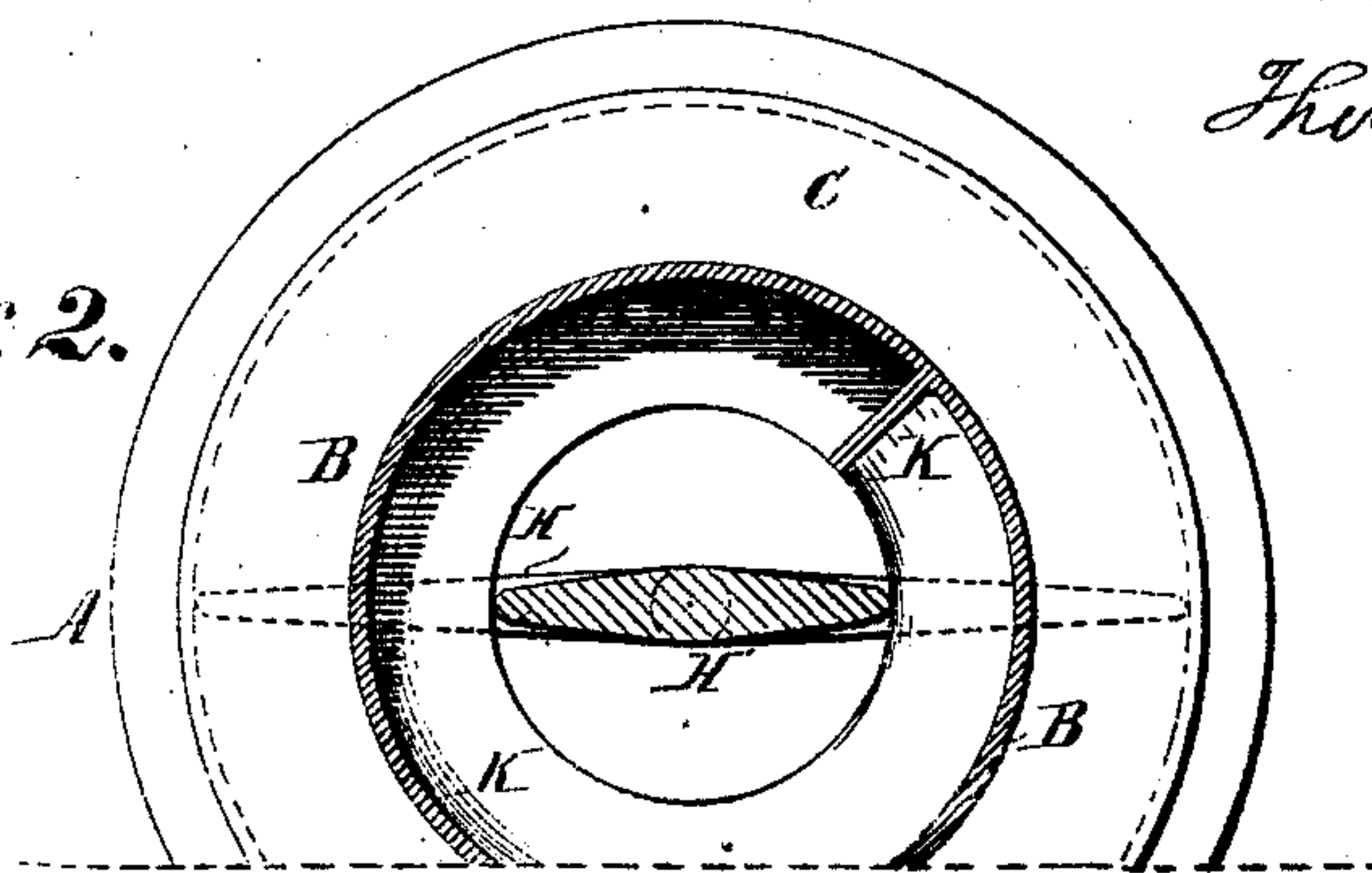


Fig. 2.



*Thos J. Lovegrove
by his Attys
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WITNESSES

*Harry Smith
John Parker*

UNITED STATES PATENT OFFICE.

THOMAS J. LOVEGROVE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. 121,637, dated December 5, 1871.

To all whom it may concern:

Be it known that I, THOMAS J. LOVEGROVE, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improved Centrifugal Liquid-Elevator, of which the following is a specification:

My invention consists of certain improvements, too fully explained hereafter to need preliminary description, on the centrifugal liquid-elevator for which Letters Patent were allowed to me on the 9th day of September, A. D. 1871.

In the drawing, Figure 1 is a sectional elevation of my improved centrifugal liquid-elevator, and Fig. 2 is a sectional plan view of the same on the line 1 2, Fig. 1.

The frame or casing of the apparatus consists of a cylindrical base, A, supported upon feet *a* or otherwise, and surmounted by a vertical cylindrical pipe or column, B, of smaller diameter than the base, and so attached to the latter by a tapering or conical connection, C, that there shall be no abrupt shoulder within the apparatus between the said base and column. The interior of the base is divided by a horizontal-position ledge, *b*, into two chambers, E and F, of about equal size, and communicating with each other through a central opening, *c*, in the partition, of about the same diameter as the column B above. In the side of the lower chamber E is an inlet-opening or openings, *d*, for the water or other liquid which is to be elevated, and extending entirely across the upper chamber F, and of equal height with the same, is a flat blade, H, secured to a shaft, G, which extends vertically upward through the center of the apparatus nearly or quite to the top of the same, turns in bearings *e* and in a step, *e'*, and is provided with a driving-pulley, *f*, through the medium of which and a belt, *f'*, it can be caused to rotate at any required rate of speed. A narrower blade, H', also attached to and arranged to turn with the shaft, is secured to or forms part of the blade H, and extends upward through the center of the column B; and secured to the interior of the latter, and occupying the entire space between the walls of the same and the blade H', is a continuous and unbroken spiral flange or screw-thread, K, terminating above at the outlet opening or openings at the top of the column and merging gradually below into a wider spiral flange, K', contained within the conical portion C of the casing, and terminating abruptly at the bottom in a ledge, *g*, just above the

chamber F, and as close as possible to the upper edge of the blade H. Although I have mentioned and prefer to use one blade, H and H', other blades may, if desired, be secured to the shaft transversely to those described.

In the centrifugal liquid-elevator for which Letters Patent were allowed to me on the 9th day of September, A. D. 1871, the column B, with its spiral flange, communicated directly and abruptly with the chamber E, down to which the blade H' also extended, and the chamber F, blade H, conical portion C of the casing, and its spiral flange K', were not shown. I have found, however, that by the use of these additional parts the apparatus is rendered much more effective, as will be evident from the following description of its operation: A rotary motion being imparted to the shaft G and its blades H and H', the water or other liquid to be elevated is admitted to and fills the lower chamber E, and is then drawn or passes upward through the opening *c* into the chamber F, where it is rapidly carried round by and with the blade or blades H, and is consequently thrown by centrifugal force against the walls of the chamber and prevented from again descending by the ledge *b*. This being the case, the liquid to which this centrifugal force is imparted passes from the chamber through the only outlet provided for it—that is, over the ledge *g* and through the conical portion of the casing above the spiral flange K' until it enters the column B, within which it is forced around and around by the rotating blade H', and at the same time thrown outward, so that, in consequence of the uninterrupted centrifugal action, it must necessarily follow the spiral flange or screw-thread, mounting higher and higher, until it finally escapes from the outlet at the top of the column. In this way water or other liquid may be rapidly elevated to a height only limited by the height of the column, the operation being continuous, so long as the shaft and blades are revolved, and the flow uniform from the point of discharge.

As a modification of my invention, it may be mentioned that the column B can, in some instances, be enlarged in diameter above so as to form a second chamber, F, in which can be caused to revolve an enlargement of the blade H', forming an additional blade, H. This modification will be readily understood without further description or illustration in the drawing.

I claim as my invention—

1. A centrifugal liquid-elevator, in which are combined an enlarged cylindrical base, A, a column, B, of smaller diameter, and a tapering or conical casing, C, between the said base and column, all substantially as specified.

2. The combination, substantially as described, of the chambers E and F, conical casing C, and column B.

3. The blade H' secured to the shaft G, and having one or more enlargements, H, adapted to a chamber or chambers, F, communicating with the column B.

4. The combination of the blades H and H' secured to the shaft G and adapted to the chamber F, casing C, and column B, substantially as herein set forth.

5. The combination of the partition or flange b between the chambers E and F with the blade H revolving in the latter of the said chambers.

6. The combination of the blade H with the spiral flange K' arranged within the conical casing C, and forming a continuation of the spiral flange K of the column B.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

T. J. LOVEGROVE.

Witnesses:

WM. A. STEEL,
HARRY SMITH.

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