S. L. Avery,

Windlass Water Elevator,

No. 54,276. Patented May 1, 1866.

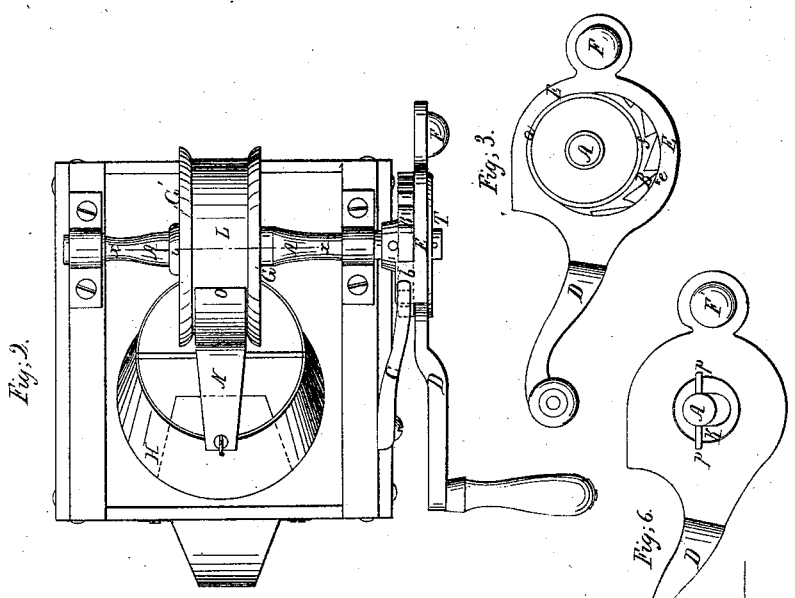

Fig. 2.

Fig. 3.

Fig. 6.

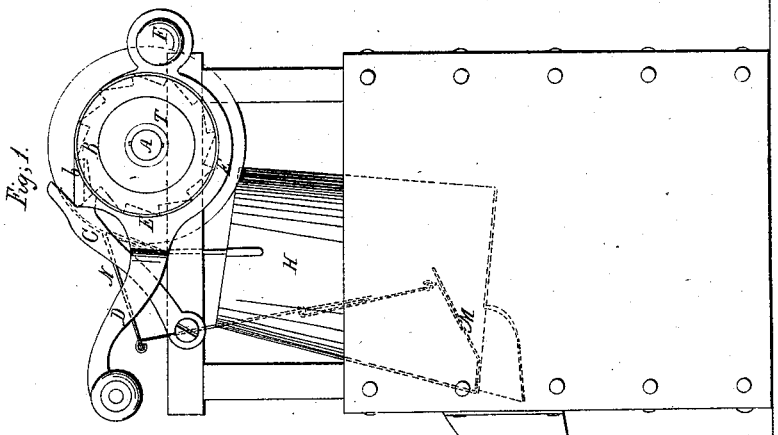

Fig. 1.

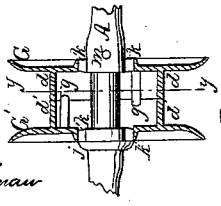

Fig. 4.

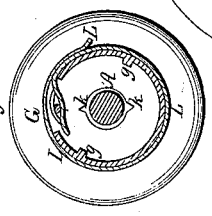

Fig. 5.

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UNITED STATES PATENT OFFICE.

STEPHEN L. AVERY, OF NORWICH, NEW YORK.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. **54,276**, dated May 1, 1866.

To all whom it may concern:

Be it known that I, STEPHEN L. AVERY, of Norwich, in the county of Chenango and State of New York, have invented certain new and useful Improvements in Water-Elevators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of my improved apparatus, with dotted lines, showing position of working parts, properly concealed from view. Fig. 2 is a top view of the same; Fig. 3, a detached view of the crank and ratchet with the outer confining-plate removed; Fig. 4, a vertical section through the sectional drum in the line *x x* of Fig. 2; Fig. 5, a vertical section at right angles to the last in the line *y y* of Fig. 4; and Fig. 6, a side elevation of a crank and attachments, which may be substituted for that represented in Figs. 1 and 2 as an equivalent thereof.

Similar letters indicate like parts in all of the figures.

My improvements relate, first, to the arrangement and combination of a weight with the annular friction-collar upon the crank of the windlass; second, in the combination of a central circular slotted washer with the annular friction-brake of the crank; third, in a novel construction of the windlass-drum; and, fourth, to the manner of constructing the valve-rod of the bucket.

Upon the outer end of the windlass-shaft A, which is supported at either end in suitable bearings arranged upon the well-curb in the ordinary manner, is secured a ratchet-wheel, B. A pawl, C, pivoted to the well-curb in front of the ratchet-wheel, falls upon and engages with the teeth of this wheel. An outwardly-projecting flange, *a*, Fig. 3, is formed upon the outer face of the ratchet-wheel B. (See Fig. 3.)

The crank D of the windlass is secured to a slight elongated collar, E, which fits very loosely upon the flange *a* of the ratchet-wheel B. This collar is provided with an inwardly-projecting catch, *b*, so formed upon its upper inner side, as seen in Fig. 2, as that it will rest upon the teeth of the ratchet and engage therewith when turned in one direction, but when turned in the opposite direction, so as to slip over the teeth, will catch against the end of the pawl C and lift it back away from the ratchet, leaving the wheel and windlass-shaft entirely free in its bearings. As the weight of the crank would in itself suffice to raise the pawl and free the windlass, a counter-weight, F, is formed upon a projection on the collar E at a point opposite the crank D, as illustrated in Figs. 1, 2, and 3 of the drawings, so that a slight pressure upon the crank is required to disengage the pawl from the ratchet-teeth. It is evident that, from the peculiar shape of the collar E, if the pressure upon the crank required to relieve the ratchet-wheel B from the pawl C is increased, the lower portion of the collar—say at *e*, Fig. 3—will be brought to bear against the flange of the ratchet-wheel—say at *f*—and will act as friction-brake against the same, enabling the operator to control at pleasure the revolution of the windlass-shaft. The crank and its collar are kept in place by means of an outer head-plate, F, Figs. 1 and 2, secured by a pin, *c*, running through the end of the shaft. Thus it is seen that, by turning the crank D of my improved apparatus in the usual direction, (indicated by the arrow in Figs. 1 and 3,) the catch *b*, engaging with the teeth of the ratchet-wheel, will carry it around, and thus cause the windlass-shaft to revolve so as to elevate the bucket from the well, the pawl C at the same time clicking in the teeth to prevent an accidental reverse movement. If, however, the movement of the crank be reversed the catch *g'*, engaging with the pawl C, as seen in Fig. 1, will disengage it from the teeth of the ratchet-wheel, leaving the windlass perfectly free to turn, except so far as it may be checked by the friction of the collar E against the flange *a* on the face of said wheel, this friction being obtained by pressure upon the crank D, which acts as a lever, having a fulcrum at its point of contact with the pawl C.

The windlass-drum of my improved apparatus is constructed of two metallic sections, which may both be cast in the same mold. These two sections are each formed, as seen in Fig. 4, of circular side plates, G and G', whose edges curve outwardly, each having an annular flange, *d d'*, of about one-half its diameter, projecting inwardly therefrom, so that when the sections are placed together these flanges meeting will form the drum, as seen in Figs. 2 and 4. To secure coincidence of contact between the edges of these annular flanges *d* and *d'*, when brought together to form the

drum, transverse cleats *g g* are formed upon the inner periphery of the flanges, and made to project somewhat beyond the edge thereof, so as that when the two flanges *d* and *d'* are brought together the ends of each cleat will catch under the edge of the opposite flange, as seen in Fig. 4, and thus prevent the edges in contact from slipping. The two sections forming the drum are slipped upon the windlass-shaft and kept from turning thereon by means of lugs *k k*, Figs. 4 and 5, upon the shaft, which fit into corresponding recesses in said sections, as clearly illustrated in Fig. 5 of the drawings. The rear section, G, slips back against a collar, *i*, on the shaft, and the front section, G', after being brought closely against the first so as to form the drum, as seen in Figs. 2 and 4, is secured by means of a pin, *m*, driven through an aperture pierced in the shaft, Fig. 4.

The bucket H of my improved apparatus is elevated by means of a band or strap, L, equal in breadth to the width of the drum, as seen in Fig. 2. It is provided with a bottom valve, M, and discharge-spout of the ordinary form, as seen in the dotted lines, Fig. 1. The bail of the bucket is so proportioned in length as that when the bucket is fully elevated its rim will strike against the windlass-drum, and thus cause its bottom edge to be thrown forward against the well-curb, which is fitted with discharging-spout at this point, into which the mouth of the spout in the bottom of the bucket will project when thus thrown forward. To raise the valve M at the moment when the bucket is thus lipped against the discharge-spout of the curb, I secure a rigid arm, N, to the strap L, by which the bucket is elevated, so that it will project downward therefrom at an acute angle. The outer end of this arm N is connected with the vibrating end of the valve M by means of a rod, O. When, by winding the strap upon the drum in raising the bucket, it has reached the proper point for the discharge of its contents, the arm N, passing over the periphery of the drum, is thereby thrown up at such an angle as to raise the valve in the manner illustrated in Fig. 1.

In order to lessen the weight upon the valve and facilitate its opening when let down into the water, I form the connecting-rod O in two pieces, *s s'*, uniting them by a sliding joint, as seen in the dotted lines of Fig. 1, so that the weight of the lower section alone is supported by the valve M, the upper section being sustained by the arm N.

In order to obviate the necessity of the extra head-plate T, illustrated in Fig. 2, which is not herein claimed as new, I contemplate substituting the form of crank illustrated in Fig. 6 for that hereinbefore described. This crank has a circular end plate instead of an annular collar, E, but of the same exterior dimensions. A central circular aperture is pierced in this plate, into which is fitted a circular washer, K. This circular washer is pierced by an elongated slot whose width is equal to that of the end of the shaft A. The crank and washer are slipped upon the end of the shaft until the catch *g* rests upon the ratchet, as in the case of the crank D, and are then secured thereon by means of a simple pin, *p*. This arrangement permits the crank to have the necessary play upon the shaft by means of the slotted aperture in the washer, and at the same time a rotary motion upon said washer, and as the whole is secured by the simple pin *p* no head-piece is required. The use of the weight F upon the crank obviates the necessity of springs, &c., to accomplish the desired end.

Having thus fully described my improvements in water-elevating apparatus, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination, as herein described, of a weight, F, with the rim of a loose annular friction-collar, E, when said collar is combined with a crank, D, and with the ratchet-wheel of a windlass, substantially in the manner and for the purpose herein set forth.

2. The combination of a central circular slotted washer, K, with an annular friction brake and crank, D', and with a shaft, A, substantially in the manner and for the purpose herein described.

3. The metallic windlass-drum, when said drum is composed of two sections, G G, formed substantially as herein described, and united together and secured upon a shaft in the manner herein set forth.

4. In combination with the valve M of a well-bucket, a jointed connecting and lifting rod, O, made substantially in the manner and for the purpose herein set forth.

The foregoing specification of my improvement in water-elevators signed by me this 8th day of July, 1865.

STEPHEN L. AVERY.

Witnesses:

P. L. WESCOTT,

J. W. MILLER.