E. L. Yorks,

Windlass Water Elevator.

No. 38,856. Patented June 9, 1863.

Fig: 1.

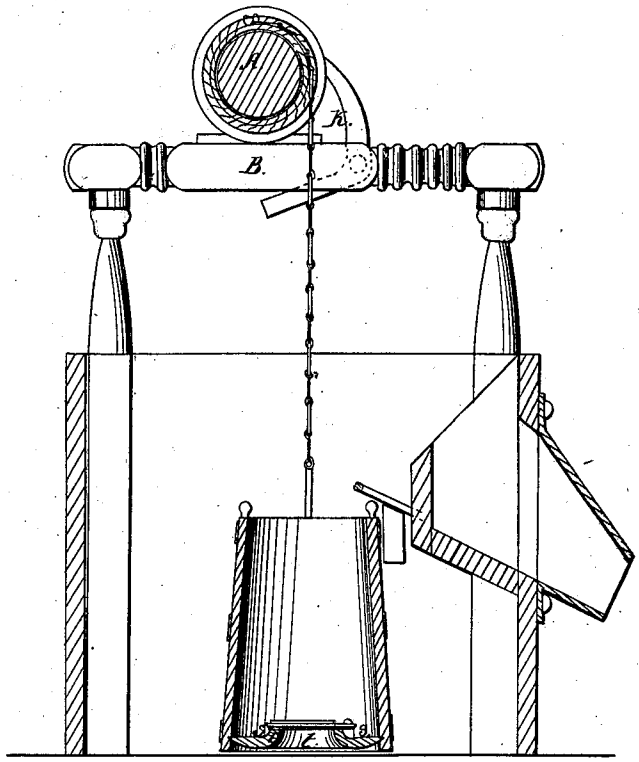


Fig: 5.

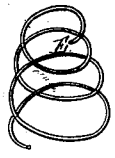


Fig: 2.

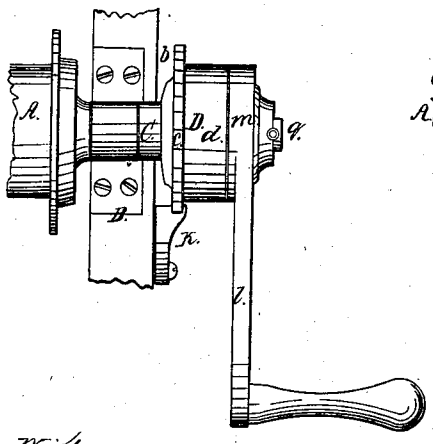


Fig: 3.

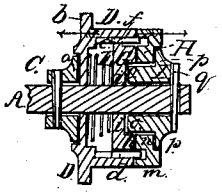


Fig: 4.

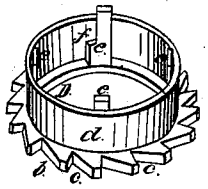


Fig: 6.

Fig: 7.

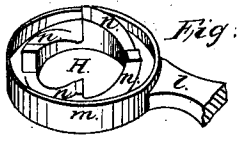
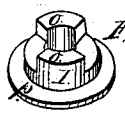


Fig: 8.



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UNITED STATES PATENT OFFICE.

ELIAS L. YORKS, OF HONEOYE FALLS, NEW YORK.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. **38,856**, dated June 9, 1863.

To all whom it may concern:

Be it known that I, ELIAS L. YORKS, of Honeoye Falls, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Apparatus for Drawing Water from Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a vertical section of a well curb with my improvements applied thereto; Fig. 2, a plan of a portion of the same, showing more particularly the brake arrangement connected with the crank and windlass; Fig. 3, a central vertical section of the brake arrangement, in the plane of the red line, Fig. 2; Figs. 4, 5, 6, 7, and 8, perspective views of the parts composing the brake arrangement, detached.

Like letters of reference indicate corresponding parts in all the figures.

My improved machine is of that class in which a brake-power is applied to the windlass to prevent the bucket running down too fast, by merely reversing the crank; and the invention consists in the construction, arrangement, and combination of the parts connected with the crank and end of the windlass.

The parts are all mounted in a suitable curb, the windlass A having its bearings in supports B B, on opposite sides. At a suitable position outside the bearing, on the crank end, is secured rigidly to the shaft a circular shoulder, C, Figs. 2 and 3, having a plane face, *a*, against which a portion of the brake-friction is applied laterally, instead of vertically, as usual, as will presently be explained. The apparatus operating in connection with this shoulder consists of six principal parts—viz., a ratchet-box, D, a coiled spring, E, and adjusting gear-plate, G, a crank-gear, H, a coupling gear, I, and a pawl, K. These parts are constructed and arranged as follows: The ratchet-box D, Figs. 2, 3, and 4, consists of a ratchet-disk, *b*, having a central hole for the passage of the shaft, (the back of the disk being made plane to bear against the shoulder C,) and provided with ratchet-teeth *c c*, into which catches the pawl K, jointed to the support B, and, also, of a cylindrical flange, *d*, of suitable diameter and projection to inclose the other parts. On the inside of this flange are a suitable number of projecting ribs *e e*, or equivalents, the inner ends being made of greater width than the outer ones, so as to form, at the proper position, shoulders *f f*, for a purpose that will be directly explained. Within this box thus formed fits loosely the circular gear-plate G, Figs. 3 and 6, with the spiral spring E intermediate to react against the plate. The edge of the gear-plate is provided with notches *g g*, or equivalent, whose number and position correspond with the ribs *e e*, over which they slide, and whose size corresponds with the greatest width of said ribs. It is apparent that the arrangement of the notches *g g* and ribs *e e* may be reversed—that is, the notches may be made in the flange of the ratchet-box, and the ribs a part of the gear-plate, with the same effect. The outside of the gear-plate, or that side opposite the spring, has a number of concentric teeth or ratches, *h h*, raised on its surface at regular intervals apart, said teeth being abrupt or right-angled at the forward end, and inclining down gradually in the rear, as shown in Fig. 6. This face of the plate is also provided with spaces or depressions *i i*, Fig. 3, situated between shoulders *k k*, Fig. 6, into which engage the projections of the coupling-gear, as will presently be described. The crank-gear H, Figs. 3 and 7, to which the operating-lever *l* is secured, is provided with a short flange, *m*, of similar diameter and shape to the flange *d* of the ratchet-box, against which it abuts when in place. It is also provided with concentric raised teeth *n n*, similar in shape, size, number, and position with those of the gear-plate G, already described, except that they point in the opposite direction. When the parts are fitted together, the inclined teeth *h h* and *n n* gear or engage when the crank is turned forward, but ungear as it is turned back. Centrally through the crank-gear is a circular hole, through which passes the cylindrical end of the coupling-gear I, having projections *o o*, Fig. 8, which, when the crank is turning forward, engage with the depressions *i i*, above described, as represented in Fig. 3. The coupling-gear is provided with a plane shoulder or face, *p*, similar to the face *a* of the shoulder C, and for the same purpose—viz., to receive the brake-friction. The coupling-gear is secured rigidly to the shaft of the windlass by means of a pin, *q*, or in some equivalent

manner. The other parts, D G H, are not rigidly secured, but have a turning motion on the axis. The action of this arrangement is as follows: The coupling-gear I being rigidly secured to the shaft, (the gear-plate being engaged with it by the projections and depressions *o i*,) the gear-plate and crank-gear being engaged by the teeth *h n*, and the gear-plate and ratchet-box being engaged by means of the ribs and notches *e g*, the whole are turned when the crank is moved forward. The parts are thus retained in engagement by the gear-plate resting upon the shoulders *f f* of the ribs *e e*, which prevent the said plate being forced inward, so as to release the parts. When the crank is turned backward in the opposite direction, (the ratchet-box being held by the pawl K,) the inclines of the teeth *h n* acting on each other have a tendency to separate the crank-gear and gear-plate from each other. This action turns the latter backward sufficiently to release it from the shoulders *f f* of the ribs, allowing the notches *g* to fall over the wide portion of the ribs, and the gear-plate to be forced back within the ratchet-box sufficiently to disengage it from the projections *o o* of the coupling-gear, when, of course, the crank is disengaged from the shaft, and the windlass turns independently.

The parts C and I being rigidly secured to the shaft, it is manifest that the same action that expands the parts sufficiently to free the windlass will also cause them to bear on the faces *a p*, thus producing a lateral friction that can be varied to any degree desired.

I am aware that a brake-power has before been applied to the windlass by the reverse action of the crank; but in all devices with which I am acquainted it is produced vertically, instead of horizontally or laterally, and the means of producing it are entirely dissimilar to mine. By this arrangement I obtain a larger frictional surface than in any other device, and the frictional contact is sustained the whole distance around, instead of at only a certain point. My device, therefore, is more enduring and will longer resist wear.

I prefer to use a tilting bucket that has a valve in its bottom for admitting the water at the bottom of the well. In ordinary buckets the bottom is made plane, with the valve set on the same level. The valve admits much sand and dirt with the water, and when thus arranged this collects, so that the valve does not shut down closely, and the consequence is that the bucket leaks, so as to be frequently inoperative. It also rots the leather and renders it worthless. I remedy this difficulty by forming the bottom of the bucket with its seat *r* forming a thin, plane edge on top, elevated above the general level of the floor, and having inclined or vertical sides *s* extending downward, as represented in Fig. 1. This arrangement also forms the port *t*, of such a length as to give a direction or motion to the water that enters, so that it passes in with a current or positive action. In doing so it sweeps over the edge of the seat *r*, carrying with it all sand or dirt that has gathered thereon, and keeping it always clean, and the bucket always tight. The narrow edge of the valve-seat allows the valve to pack tightly upon it.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The ratchet-box D, consisting of the disk *b*, having a laterally-bearing frictional surface, the cylindrical flange *d*, and the ribs *e e*, or equivalent, said ratchet-box turning loosely on the shaft and held by the pawl K, substantially as herein described.

2. In combination with the ratchet box thus arranged, the gear-plate G, having notches *g g*, or equivalent, sliding over the ribs *e e* in such a manner as to hold on the shoulders *f f* when turned forward, but to be disengaged therefrom when turned back, substantially as specified.

3. In combination with the gear-plate, provided with the concentric inclined teeth *h h*, the crank-gear H, having similar engaging teeth *n n*, substantially as and for the purpose herein set forth.

4. In combination with the gear-plate G and crank-gear H, the coupling-gear I, arranged and operating substantially as herein specified.

5. The combination and arrangement of the ratchet-box D, coiled spring E or equivalent, gear-plate G, crank-gear H, coupling-gear I, pawl K, and frictional bearing-shoulders *a p*, whereby the whole automatic action is produced, substantially as herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ELIAS L. YORKS.

Witnesses:
R. F. OSGOOD,
J. FRASER.