# J. D. Willoughby,

## Windlass Water Elevator,

No. 7,944. Patented Feb. 18, 1851.

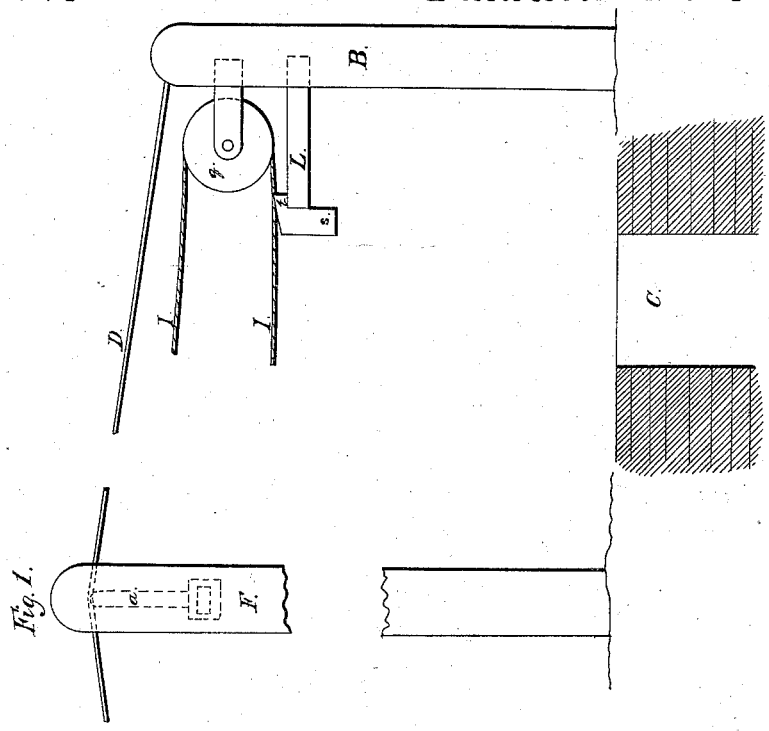
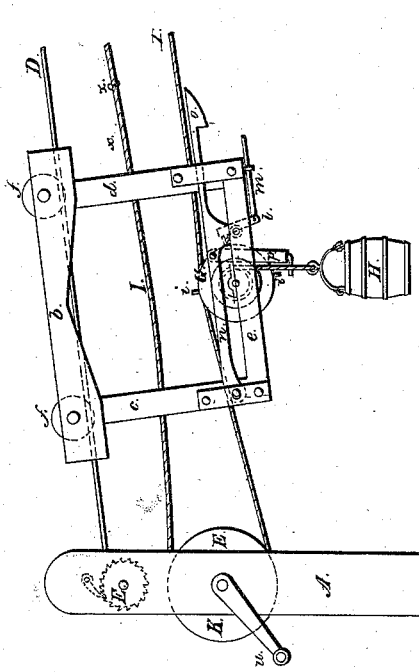



Fig. 1.



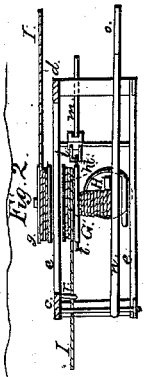



Fig. 2.

# UNITED STATES PATENT OFFICE.

JAMES D. WILLOUGHBY, OF SCOTLAND, PENNSYLVANIA.

## IMPROVEMENT IN APPARATUS FOR RAISING AND CARRYING WATER.

Specification forming part of Letters Patent No. 7,944, dated February 18, 1851.

*To all whom it may concern:*

Be it known that I, JAMES D. WILLOUGHBY, of Scotland, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in the Telegraph Water-Carrier, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 represents a side elevation of my apparatus, and Fig. 2 is a horizontal section of the car above the windlass.

In my original telegraph water-carrier the track is supported on posts, of which there must be at least one which must be higher than those which precede and succeed it; and where more than one intermediate post is required, they should be so arranged as to give the wire track a regular slope in each direction from the highest. This arrangement of the posts, although well suited to many cases, is in some cases impracticable from the nature of the ground intervening between the well and the starting-post, or only attainable at a considerable outlay.

The object of my present improvement is to obviate this difficulty, which I do by the substitution of a double-draft cord in place of the single-draft cord of the original machine, this endless cord being so connected with the carriage-windlass that it performs the twofold purpose of propelling the carriage to and fro and of lowering and raising the bucket at the well. By this improvement I am enabled to surmount any obstacles which may intervene between the starting-post and the well, and to propel the carriage over ground having an extremely irregular surface, without the expense of the high supporting-posts, which are frequently necessary when the telegraph water-carrier is put up according to my original plan.

In the accompanying drawings, A is a post, which is erected at the point where the water is to be delivered. A second post, B, is erected at that side of the well C or other source whence water is to be procured which is farthest from the starting-post A. The two posts are connected by a wire track, D, one of whose extremities is made fast to the well-post B, while the other is secured to the barrel of a windlass, E, upon the starting-post A, by means of which the track can be strained. The track between the two posts A B is supported at suitable distances by arms *a*, projecting from intermediate posts, F. A car is constructed to run upon the wire track. This is composed, mainly, of two upper rails, *b b*, of two side pieces, *c d*, and of two lower rails, *e e*. The upper rails support the axles of a pair of wheels, *f f*, whose rims are grooved to run upon the wire track. A windlass, G, is mounted upon the car, the journals of its shaft being supported by boxes secured to the lower rails, *e e*. The barrel of this windlass is divided into three sections, *g h k*, two (*g h*) of which are of equal diameter, while the remaining one (*k*) is considerably smaller. Pins *i* are inserted in the windlass, which project far enough from its surface to come in contact with a detent, *l*, by means of which the windlass is prevented from turning. The detent is pivoted near its middle to the lower rails, *e*, and is furnished with a tongue, *m*, which projects beyond that side piece of the car nearest the well-post. A bar, *n*, hooked at its front extremity, *o*, is pivoted by its hinder extremity to the side piece, *c*, of the car nearest the starting-post. The hooked extremity of this bar also projects beyond the side piece, *d*. A rod, *p*, is pivoted to this bar and depends from it beneath the lower rails of the car, where it terminates in an eye. A well-bucket cord is made fast to the smaller section, *k*, of the windlass-barrel, and, being passed through the eye in the lower end of the depending rod *p*, is made fast to the well-bucket H. A draft-cord, I, is made fast at one of its extremities to one (*h*) of the larger sections of the windlass G on the car. It is then passed through an eye, *r*, upon the car, and is conducted to a windlass, K, on the starting-post. It is passed round this windlass-barrel, and is thence conducted to the well-post B. At this point it is passed round a pulley, *q*, whence it is returned to the car and secured to the other larger section, *g*, of the car-windlass. This cord is sufficiently long to admit of a portion of it being wound upon the barrel of the car-windlass. It should be supported between the starting-point and well-posts by sheaves on the intermediate posts.

In adjusting this machine for use I commence by making the well-rope fast to the car-windlass. I then turn the latter to wind upon it a quantity of the well-rope sufficient to permit the bucket to descend from the car into the water in the well. I next make fast

one extremity of the draft-cord to the car-windlass at *h*, and by drawing off the well-rope turn the windlass and wind up the draft-cord an equal number of turns. The draft-cord is then passed through the eye *r* and a knot too large to pass through the eye is tied in it. The draft-cord is then passed round the windlass E on the starting-post A, is conducted to the well-post, and is thence returned to the car, where its extremity is wound two or three turns round the car-windlass at *g*, and is then made fast thereto. An arm, L, is projected from the well-post, and is furnished at its projecting extremity with a plate, *s*, facing the end of the car, and with an inclined block, *t*, whose inclined face is toward the car. When the apparatus is ready for use, the car occupies the position in which it is represented in the annexed drawings, the bucket-rope being wound upon its windlass. When water is wanted, power is applied either through the intervention of a crank, *u*, upon its shaft or by some other suitable device to turn the windlass at the starting-post in the direction indicated by the arrow *v*. By this operation the lower member of the draft-cord is let out, while the upper is wound up and the car is drawn toward the well-post. As it nears this point the hooked extremity *o* of the bar passes over the inclined block *t* and engages with it, while the tongue *m*, striking the face of the plate *s*, detaches the detent *f* from the pin *i* with which it is in contact, and leaves the windlass free to turn. As then the motion of the windlass at the starting-post is continued, the draft-cord is drawn off from the section *g* of the car-windlass and wound up on the other section, *h*. As the car-windlass is thus forced to turn, the bucket-rope is unwound and the bucket is let down into the well. This turning of the windlass at the starting-post is continued in the same direction until the movement of the draft-cord is stopped by the knob *x* striking the eye *r*, which stoppage indicates that the bucket-cord is all unwound. The operator then reverses the motion of the windlass, and thus reverses the motion of the draft-cord, which, as the car is held fast by the hooked bar *n*, is now drawn off the section *h* and wound upon the section *g*. The motion of the car-windlass is thus reversed, and the bucket-rope is wound upon its section *k* to draw up the bucket. As the latter nears the bottom of the car its bail strikes the depending rod *p*, which, with the hooked bar *n*, is raised. By this operation the car is set free from the well-post, and, as the motion of the windlass at the starting-post is continued, is drawn by the draft-cord to the point whence it started. As the car leaves the well-post the detent *l* reengages with the pin *i* on the car-windlass, and thus prevents the latter from turning.

In order to render the operation of my apparatus clearer, I have represented the direct and return portions of the endless draft-cord as supported at an equal height on the same side of the posts; but I prefer to support them at the same height on opposite sides of the posts, thus keeping the return portion of the cord clear of the carriage. It will thus be perceived that the endless draft-cord effects the double purpose of propelling the carriage to and fro and of lowering and raising the well-bucket, while at the same time its adoption enables the constructor to run his carriage-track over the most uneven ground without compelling him to make it of uniform slope.

All the different parts of the carriage admit of variation in their form and arrangement without affecting the principle of the invention, and I reserve the right to make any such modification as may be deemed expedient.

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

The double-draft cord, so arranged and connected with the car-windlass that it effects the twofold purpose of propelling the carriage to and fro, and of turning the car-windlass to unwind and wind up the bucket-cord, thus insuring the descent of the bucket into the well.

In testimony whereof I have hereunto subscribed my name.

J. D. WILLOUGHBY.

Witnesses:

G. R. McILROY,

P. H. WATSON.