(No Model.) 2 Sheets—Sheet 1.

J. RYAN.

APPARATUS FOR HOISTING AND MOVING EARTH.

No. 385,527. Patented July 3, 1888.

Fig. 1

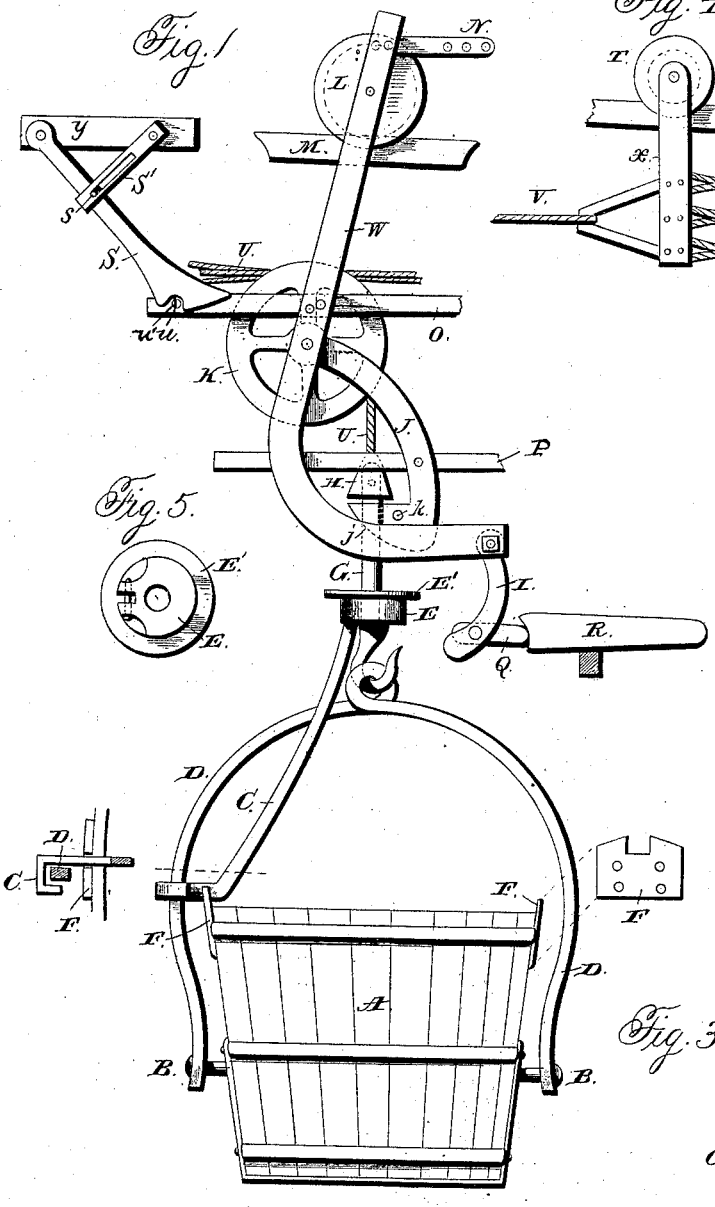


Fig. 4.

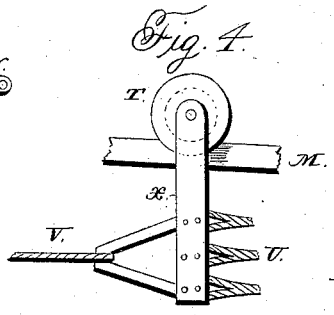


Fig. 2.

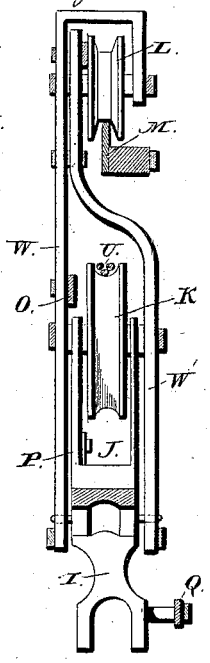
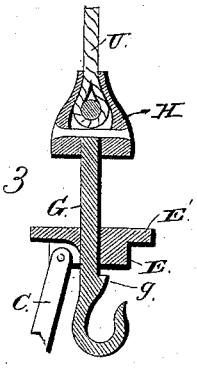


Fig. 5.

Fig. 3



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Attys.

(No Model.) 2 Sheets—Sheet 2.

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APPARATUS FOR HOISTING AND MOVING EARTH.

No. 385,527. Patented July 3, 1888.

Fig. 1.

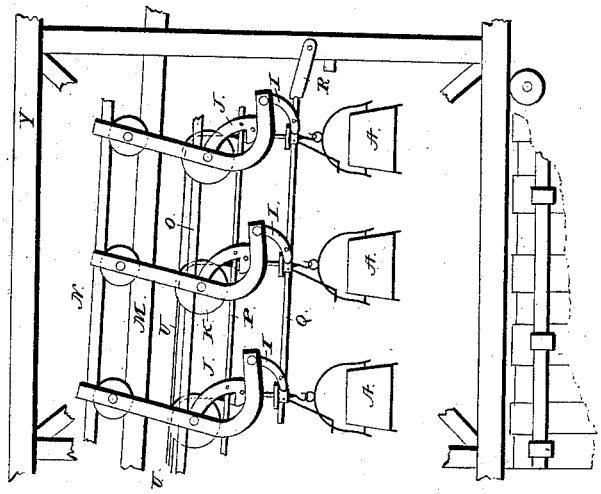
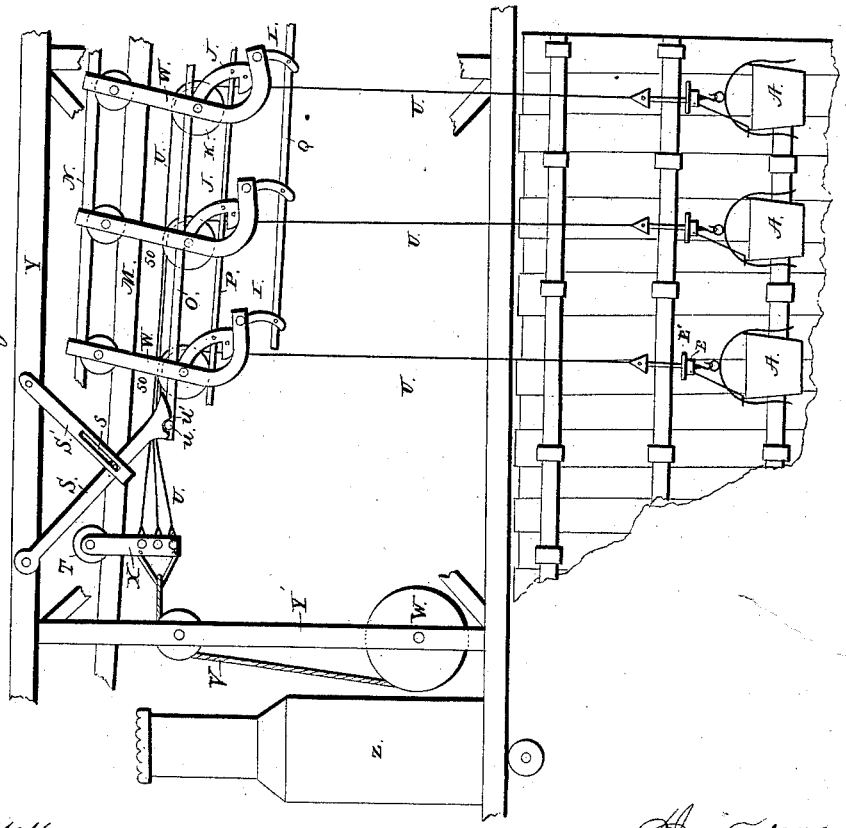


Fig. 6.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HOISTING AND MOVING EARTH.

SPECIFICATION forming part of Letters Patent No. 385,527, dated July 3, 1888.

Application filed June 25, 1887. Serial No. 242,554. (No model.)

To all whom it may concern:

Be it known that I, JOHN RYAN, a citizen of the United States, residing in the city of Toronto, in the county of York, Ontario, Canada, have invented a new and useful Apparatus for Hoisting and Moving Earth, &c., in Trenches; and I do hereby declare the following to be a full, clear, and exact description of the invention, which will be found sufficient to enable others skilled in the art to which it appertains to construct and use the same.

My invention relates to an improvement in apparatus for hoisting and moving earth.

The object is to provide a safe, practical, and labor-saving apparatus for hoisting and moving the earth from trenches or other excavations, automatically dumping this earth at the desired place, and returning and lowering the buckets into the trench and repeating the operation.

With these ends in view my invention consists in a portable frame or trestle, excavating-buckets, pulleys, locks, and connected mechanism for raising, lowering, dumping, and shifting the buckets.

My invention still further consists in certain features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of an elevator-bucket and connected elevating, carrying, and dumping mechanism. Fig. 2 is an end elevation of the carrier, showing parts in section. Fig. 3 is a section through the elevating-hook and immediately-connected parts. Fig. 4 is a detached view of the rope or cable hanger. Fig. 5 is a bottom plan view of the collar E. Fig. 6 is an elevation of the frame or trestle, showing the buckets in position to be raised or lowered; and Fig. 7 is a similar view of the frame, showing the buckets inverted, or in the position when their load is dumped.

Y represents a frame or trestle of suitable dimensions, and preferably of such a construction that it may be readily taken apart and conveniently shipped or transported from one place to another. This frame-work may be supported in the usual manner on posts or uprights, and either secured to the latter or suspended from the frame there is a track, M, extending from one end of the frame to the other with a slight slope or pitch.

One or more carriages are mounted on the track M and travel thereon from one end of the frame Y to the other, or as far as the track extends. The carrier consists, substantially, of a pair of plates of metal, W W', the former of which is bent over at the top into the form of an overhanging bracket, wherein is journaled a grooved wheel, L. The plate W' is secured at its upper end to the plate W, after which it is bent into a goose-neck, whence it extends parallel to the plate W, forming a box wherein pulley K is journaled. Thus, like other carriers of this type in common use, almost the entire weight or the center of gravity is beneath the wheel L, so that a liability of the carrier leaving or jumping its track is very slight. The lower end of the carrier is bent approximately at right angles to the upper part, and this portion furnishes a pivotal support for the depending bifurcated trigger I, yet to receive further mention. Preferably pivoted in each carrier in a manner to straddle the pulley K, journaled therein, is a drop or gravity hook, J, the lower face, *j*, of which is beveled or slanting, in order that anything upon striking it will readily slide thereon or force the hook out of the way, and a transverse pin, *k*, prevents this hook from dropping too far forward. Several of these carriers are usually held at suitable distances apart by rods N and O, which rods are pivotally or otherwise connected to each carrier. Another rod, P, pivotally connects the drop-hooks J, and still another rod connects the triggers I in a similar manner.

Over each pulley K a separate rope or cable, U, is strung, having attached to their lower ends a bracket, A, and at the opposite ends being secured to the rolling hanger X, which hanger consists of a depending catch-plate or pair of plates having a wheel, T, in their upper ends, which latter is mounted on track M. To this rolling hanger a rope or hanger, V, is attached and strung over pulleys or winding-drums W, these pulleys or drums being operated by means of an engine, Z.

The buckets A are provided with a bail, D, pivoted at point B below the center of the

bucket, and this bail is provided with an eye, which receives the hook on the end of the rope or cable. This hook is provided with a boss, *g*, just above the hook, above which a collar, E, is loosely mounted. At its upper end this collar is provided with an annular flange, E′, and pivoted to the collar beneath the flange is a link, C. The lower end of this link is loosely bent around the bail D, and it projects over the edge of the bucket in position to normally enter a notch in catch-plate T, secured on the side of the bucket, which adjustment of parts locks the bucket right side up. The upper end of the hook-shank terminates in an eye, through which the rope or cable U is inserted and fastened, and over this eye and the end of the rope a cone-shaped button, H, is mounted, the lower end of said button being at the bottom, so that when the tapering portion of the button abuts against the inclining lower face of drop-hook J it forces the latter to one side until it has passed above the hook, when the latter by gravity drops into the position shown in Fig. 1 under the button, the pin *k* striking against the hook G, and thereby limiting the swing of the drop-hook J. The button H is composed preferably of two sections riveted together, the rivet extending through the eye of the hook below the rope.

A latch-hook, S, is pivoted to the frame near its forward end, and this hook is provided with an inclining lower face and a notch, *u*, in said face, said notch being adapted to receive one of the pins in the carrier-connecting bar O, in order to lock the carriers in any position. A slotted link, S′, has sliding pivotal connection with this hook S and prevents it from dropping below the plane of bar O or the pins therein, and at the same time the slot in this link permits a pin, *s*, on the hook to slide in the slot when the hook is moved.

The operation is briefly as follows: With the buckets in the position shown in Fig. 1, the carriers are drawn along the track M to a point over the trench or excavation, as shown in Fig. 6, this being accomplished by winding the rope or cable V on the windlass W, the button H meanwhile being seated on the drop-hook J. As soon as one of the pins *u′* is caught in the notch *u* of the latch the rod P is pushed backward, removing the hooks J from the buttons H, so that the buckets may be lowered from the engine. Immediately upon the buckets becoming loaded the engine or motive power is set in motion and the buckets are again elevated until the buttons H strike the hooks J, forcing them to the position shown in dotted lines, Fig. 1, whence they drop beneath the buttons, thus holding the buckets elevated. The hook S is now removed from the pin *u′* by hand or other means, and the carriers with their loads descend the inclining track M until the end of rod I abuts against the pivoted stop R, thus driving the triggers I beneath the flanged collar E, forcing the latter up and removing the links C from the catch-plates F, permitting the buckets to turn over and dump their contents into carts, chutes, or other places. The cartman or the person loading the buckets may right them again, the operation being very simple. By drawing on the rope or cable V the buckets are drawn back to be refilled. Thus it is seen how simple and effectual the operation is.

It is obvious that two or more sets of carriers might be employed, and this is indeed desirable when the load is to be carried for a considerable distance, one set being loaded while the other is being dumped.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus for hoisting and moving earth, the combination, with a suitable frame or trestle and a track therein, of carriers mounted on the track, each of said carriers having a pulley thereon and a drop-hook loosely mounted on the shaft or axle carrying the pulley and straddling the pulley, elevator-buckets, and ropes or cables strung over the pulleys, whereby the buckets attached thereto are elevated until automatically caught by the drop-hooks, substantially as set forth.

2. In apparatus for hoisting and moving earth, the combination, with a frame or trestle, an inclined track thereon, and a set of carriers mounted on the track, of elevator-buckets, ropes for elevating these buckets, said carriers being provided with hooks for automatically locking the buckets in an elevated position, triggers pivoted to the carriers in close proximity to the buckets, and a rod pivotally connecting these triggers to render their movement simultaneous in dumping the buckets, substantially as set forth.

3. In apparatus for raising and moving earth, the combination, with a frame or trestle and a track thereon, of a set of carriers, buckets adapted to be raised, lowered, or held on said carriers, the latter having pivoted triggers thereon, a rod connecting these triggers, and a stop pivoted in position to be abutted by the trigger-rod for dumping the buckets, substantially as set forth.

4. The combination, with a frame or trestle, a track mounted therein, carriers adapted to travel on the track, a set of buckets, ropes attached to the buckets and strung over pulleys in the carriers, and a suitable motor for elevating the buckets to the carriers, of bars for connecting the carriers, drop-hooks pivoted to the carriers and adapted to hold the buckets when elevated thereto, triggers pivoted to the carriers, a rod connecting these triggers, and a stop so located that when struck by the trigger-rod the triggers by their engagement with the buckets dump them, substantially as set forth.

5. The combination, with a carrier, a rope or cable strung over a pulley therein, and a hook on one end of the rope, of a bucket suspended on the hook, said hook having a flanged collar loosely mounted thereon, a link pivoted to the collar and mounted on the bail of the

bucket for locking the bail and bucket, a trigger adapted to elevate the collar and thereby dump the bucket, a rod pivotally connected to this trigger, and a pivoted stop in position to be impinged by the trigger-rod, whereby the latter is operated, substantially as set forth.

6. In a carrier, the combination, with a pair of plates secured together to form an overhanging bracket, and a flanged wheel mounted in this bracket, of a pulley mounted between the plates, and a drop-hook straddling the pulley, said hook having an inclining lower face, and a pin transversely located in its lower portion, this pin acting as a stop to prevent the hook from dropping too far beneath the part which it is designed to hold, substantially as set forth.

7. In a carrier, the combination, with a pair of plates secured together to form an overhanging bracket, and a flanged wheel mounted in this bracket, of a pulley mounted between the plates, and a drop-hook straddling the pulley and loosely mounted on the axle or shaft supporting the pulley, substantially as set forth.

Toronto, June 20, 1887.

JOHN RYAN.

In presence of—
E. J. REILLY,
THEO. BRAUN.