(No Model.) 2 Sheets—Sheet 1.

F. A CLARKSON.

HOISTING AND CONVEYING APPARATUS.

No. 252,740. Patented Jan. 24, 1882.

Fig. 1.

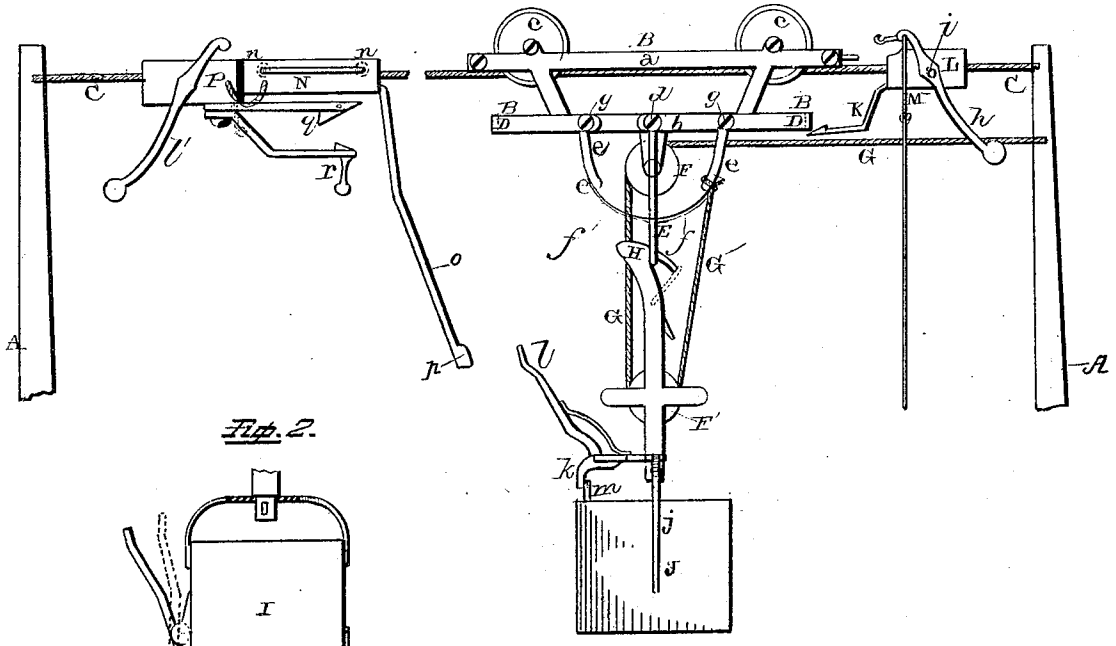


Fig. 2.

Fig. 3.

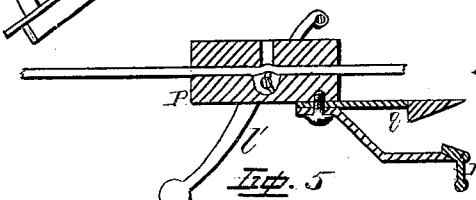


Fig. 4.

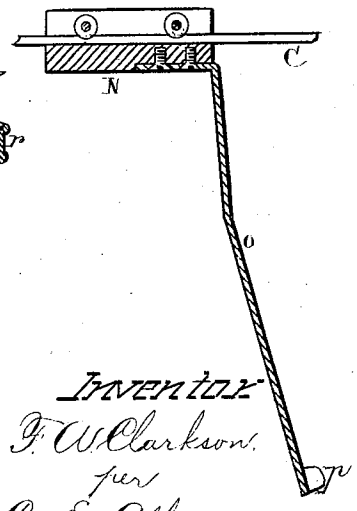
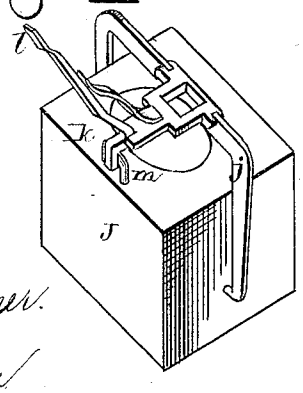


Fig. 5.



Witnesses.
W. W. Mortimer.
A. G. Hakadden

Inventor.
F. A. Clarkson.
per
C. E. Allen,
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

F. A CLARKSON.

HOISTING AND CONVEYING APPARATUS.

No. 252,740. Patented Jan. 24, 1882.

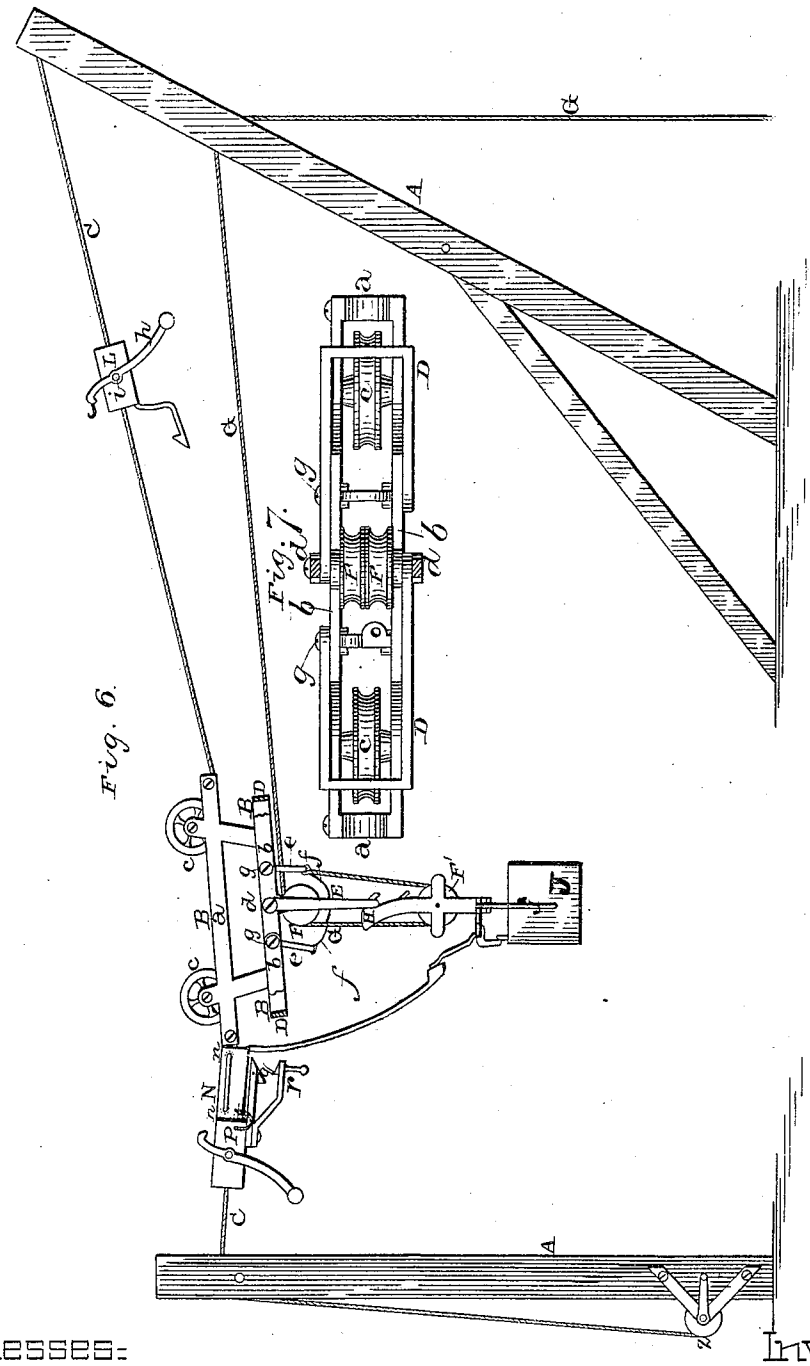


Fig. 6.

Fig. 7.

Witnesses:

J. W. Garner.

C. R. Wright

Inventor:

F. A. Clarkson,

per

C. E. Allen,

Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS A. CLARKSON, OF BLACK BROOK, VERMONT.

HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 252,740, dated January 24, 1882.

Application filed July 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. CLARKSON, a citizen of the United States, residing at Black Brook, in the county of Chittenden and State of Vermont, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention is designed as an improvement upon United States Letters Patent issued to me, dated May 15, 1877, and numbered 190,742. Its objects are to render the clamping process of the hook-catch K automatic in character, and thus greatly facilitate change of position; to increase the hoisting power of the apparatus and aid in the movement of the carriage B by making the sheaves F F′ double or in pairs; to so modify the hook or dumping block P as to render it automatically movable, as well as stationary, so that it may move down the rope or wire track C till it meets the arm of the loop-latch D, its end being protected by a rubber or spring buffer to avoid a sudden jar or jerk arising from an otherwise forcible antagonism; to construct the bucket so that it may revolve and thus discharge its contents more readily and perfectly and be less liable to injury, as well as much lighter to handle, as its bails are attached to the hook H instead of being permanently fastened to the bucket. These objects I attain by the mechanism illustrated in the accompanying drawings, in which—

Figure is an enlarged side view of the different parts. Figs. 2, 3, 4, 5 are detail views of the same. Fig. 6 is a side elevation, showing the parts on a smaller scale than is shown in Fig. 1. Fig. 7 is an inverted view of the carriage.

Similar letters refer to similar parts throughout the several views.

A A are timber standards or bents, the one nearest the place where the load is to be deposited being the shortest, so that the cable or track C, which passes over or near their tops, may be inclined in the direction in which the load is to be carried. The standards are securely braced in an erect position, and are of sufficient strength to withstand the strain of the load which is suspended from the carriage B, which is designed to run upon the cable or track C. One end of this cable is attached to the shaft of the windlass *z*, which is provided with a ratchet-wheel and pawls; or it may be connected with tackle-blocks to hold the cable in place when the tension is properly adjusted. Any device can be used in place of these standards, and the ends of the cable can be secured in any way desired, the object being to provide a track for the carriage B the tension of which shall be adjustable.

I prefer to make the carriage B in the form of a skeleton-frame. It consists of two parts—an upper division, *a*, and a lower one, *b*—both being firmly connected together. Within the former, *a*, and near either end, grooved rollers *c* are pivoted, which rest and run upon the cable C, and are designed to sustain the load which is suspended from the center of the lower division, *b*. At either end of this division *b* the loop-latches D are pivoted, their alternate ends being extended along the opposite sides of the part *b*, so as to allow the passage through them and the center of the division of a pivoting-bolt, *d*, from the exterior ends of which hang a bail or loop, E. The aperture in the division *b*, through which this bolt passes, is slotted, so that the latches and bail may have a free vertical movement at the pivotal point *d*. The bends of the loop-latches project from each end of the carriage, so as to hook over the catches, hereinafter described.

Attached to the center of the lower division, *b*, is a double sheave or two single sheaves, F. F′ is a pulley pivoted in a recess in the shank of the hook H. A double brace, *e*, pivoted to *b* at *g*, passes below the sheaves F. They are connected together a short distance below *b* by clevises *f* on either side of the sheaves.

G G are each hoisting or hauling ropes, according to the use made of them, one end of which is attached to the clevis *f*, and then passed around the sheaves F and F′ in such a manner as to secure the greatest power in comparison with the force exerted. The clevises *f* and the vertical passages through the head of the hook H serve to keep the rope in place upon the sheaves. The hook H is designed to sustain

the buckets I or J, to which its lower extremity is attached, and by the weight of which the hook is held in a vertical position. Its head is rounded or inclined, so that as it is raised it may strike, push forward, and catch upon the bail or loop E, the extremities of whose arms are pivoted to the ends of the pivoting-bolt *d*, which projects from the opposite sides of the lower division, *b*, of the carriage B. In the lower end of the hook H, through which the hoisting-rope G passes, double sheaves are arranged to avoid any friction which would tend to injure or cut the rope. The passing of the rope through its head prevents the hook H from swinging and keeps it in position to always catch upon the bail or loop E.

The bucket I is made generally as described in my Letters Patent No. 190,742, to which I refer.

My improved revolving bucket J is provided with a bail, *j*, pivoted to its opposite sides at a point below its center of gravity, so that when the hook K of the spring-lever *l* is released from the staple *m* on one side of the top of the bucket J, the weight of the bucket being above the pivoted attachments of the bail, it is at once overturned, entirely dumping its contents in the movement. It can then be readily returned to its upright position by the operator, where it is securely held by the relocking of the spring-hook K; or it may be so weighted as to resume its vertical position automatically. Its superiority consists in the ease, rapidity, and completeness with which it discharges its contents; also, in the simplicity of its construction, which renders it less liable to injury; and the ease with which it can be handled, as it revolves upon its bails instead of being rigidly attached to them. If preferred, the bails may be pivoted, so that they may be instantly released from the bucket when it is emptied.

On the side toward the higher standard A is suspended the hook-catch K upon the wire rope or cable C, to which it is firmly held or clamped by its weighted lever-arms. It projects forward from the under side of the automatic stopping or clamping block L, to which it is pivoted. Its clamping-arms *h* are rigidly connected to each other by the bolt *i*, which swings near the center of the automatic clamping-block L and immediately below the line of the cable C, which passes horizontally through the block. A projection from the center of the bolt *i* is so arranged that by the weight of the lower ends of the arms *h* it is brought so tightly against the under side of the cable as to effectually prevent the sliding of the block. A loop, M, is suspended from the upper ends of the clamping-arms, to which a rope may be attached to enable the operator to release the clamp by drawing down the upper extremities of the arms *h*, and thus depress it from its pressure upon the cable. By drawing upon the hoisting-rope on the side toward the higher standard, the loop-latch D meets, rises, and hooks upon the hook-catch K, and thus attaches the carriage B to the stopping-block L. The buckets I or J can then be lowered, filled, and elevated for transportation to the point desired, in the manner more particularly described in my Letters Patent No. 190,742, the mechanism being in other essential respects as therein specified.

To the cable C, over the place near where the load is to be dumped, the movable trip or dumping block N, arranged to run on sheaves *n n* on the cable, is placed. An arm, *o*, terminating in a curved T, *p*, projects slightly forward and downward from its under side. This T is designed to strike the upper end of the lever-catch, which drops the bottom of the bucket I, or the end of the spring-lever *l*, which retains the bucket J in an upright position. In either event the load is discharged. In the first by dropping the bottom of the bucket; in the second instance by allowing the bucket to overturn. The block moves upon rollers, so that it may be rolled at will to any point on the cable, and, if desired, may the more easily run down the depression in the cable C caused by the weight of the approaching load, till it comes in contact with the bucket and discharges the load at the dumping-place. The object in allowing it to run down to meet the approaching bucket is to prevent the otherwise forcible contact of the bucket with the block P. A rope or chain connects the block N with the block P, to limit the distance to which the former may run. It is also arranged that either block can be unclamped from the cable, and at the same time may be connected with the carriage, so that it may be drawn to any part of the line by means of an arm pivoted to the top of the block P at the end toward the carriage. To this a rope is so attached that the operator is enabled to hook the pivoted arm into the hook-latch D of the carriage. In this way the carriage may be readily adjusted for moving materials from any point over which the cable is suspended. To retain this dumping-block on any part of the cable, the movable block P, similar in construction to the stopping-block L, is designed to be automatically clamped to the cable by side levers, *l'*. It is attached to the block N by a rope or chain, and may be attached to the carriage by a hook which turns upon the bolt which unites the upper extremities of the levers *l'*. Buffers are placed upon the ends of the blocks N and P to avoid sudden jars in the contact of the carriage B with the blocks.

When it is desired not to dump, but to lower the load, the dumping-block N, with its arm *o*, is displaced, thus leaving only the stopping-block P, with its attachments, by aid of which the bucket is lowered. These attachments, which consist of an arm with the pivoting-catch *q* and a lower arm with a lever-catch, *r*, hereinafter described, retain the carriage B until the bucket has been lowered and again raised for transportation.

Projecting forward from the under side of

the block P, toward the carriage B, is an arm, at the extremity of which is pivoted the catch *q*, which drops of its own weight.

Directly below and also attached to the block P is another arm, in which, at a slight distance in front of the catch *q*, is pivoted the weighted lever-catch *r*, which is so arranged that it can swing forward only in a vertical position, but can swing backward into an inclined position, and thus allow the loop-latch D to pass over it.

The design and mechanism of the block P are similar in all essential particulars to that of the hook Y and its parts, more particularly described in my said Letters Patent No. 190,742.

As my apparatus can be suspended at any height or for any reasonable distance, it can be advantageously used where extensive buildings or deep ravines intervene. As the weight of the car is always suspended directly beneath the cable, it cannot be upset or derailed. The stopping-blocks being automatic in their adjustment, the movements of the carriage are readily limited to the points where the load is received and deposited.

As the device is designed to remove material from any point to any point on the line of the track, it is adapted not only to convey coal, stone, or any similar material, but it can be as conveniently used in making railroad excavations and adjacent fills. It is equally adapted to elevate and transport ores to a distance from the mines, transfer materials across streams, move merchandise into or from warehouses, convey building materials from any place to the spot where they are to be used, excavate ditches at one place and fill them at another, thus avoiding great expense, loss of time, and often the serious inconvenience incident to the usual method of heaping up the excavated earth into high embankments, to be then of necessity rehandled from time to time before the work of refilling can be accomplished. It is simple and durable in construction, and therefore not liable to derangement or injury, and the ease and reliability with which it can be adjusted to the many purposes for which it is intended render it a device not only novel, but one whose usefulness and value are at once apparent.

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

1. The combination of the carriage B, provided with grooved rollers *c*, the pivoted loop-latches D, and the suspended pivoted bail E, the sheaved hook H, provided with double sheaves F and its pivoted arm, and the ropes G with each other, with the cable C, and with the stopping-blocks L and P, provided with the dumping-block N, substantially as shown and described.

2. The combination of the hook H, provided with the pulley F′, bail E, rope G, pulleys F, braces *e*, united by the clevis *f*, with the carriage B, substantially as described.

3. The combination of the catch *q* and the pivoted lever-catch *r* with the block P, provided with a clamp that is operated by the levers *l′* to retain the carriage at any desired point on the cable C, for the purpose of manipulating the bucket by means of the ropes G, as herein shown and described.

4. The stopping-block L, provided with a hook-catch, K, clamps *h i*, and loop M, in combination with the cable C, substantially as shown.

5. The combination of the movable dumping-block N, provided with arm *o* and plate *p*, with the block P, clamp *l′*, catch *q*, and pivoted lever-catch *r*, substantially as described.

In testimony whereof I do affix my signature in presence of two witnesses.

FRANCIS A. CLARKSON.

Witnesses:

JAS. E. RILEY,

H. W. STETSON.