2 Sheets--Sheet 1.

G. STANCLIFF & J. GREEN.

Hoisting and Conveying Coal, &c.

No. 161,175. Patented March 23, 1875.

Fig: 2.

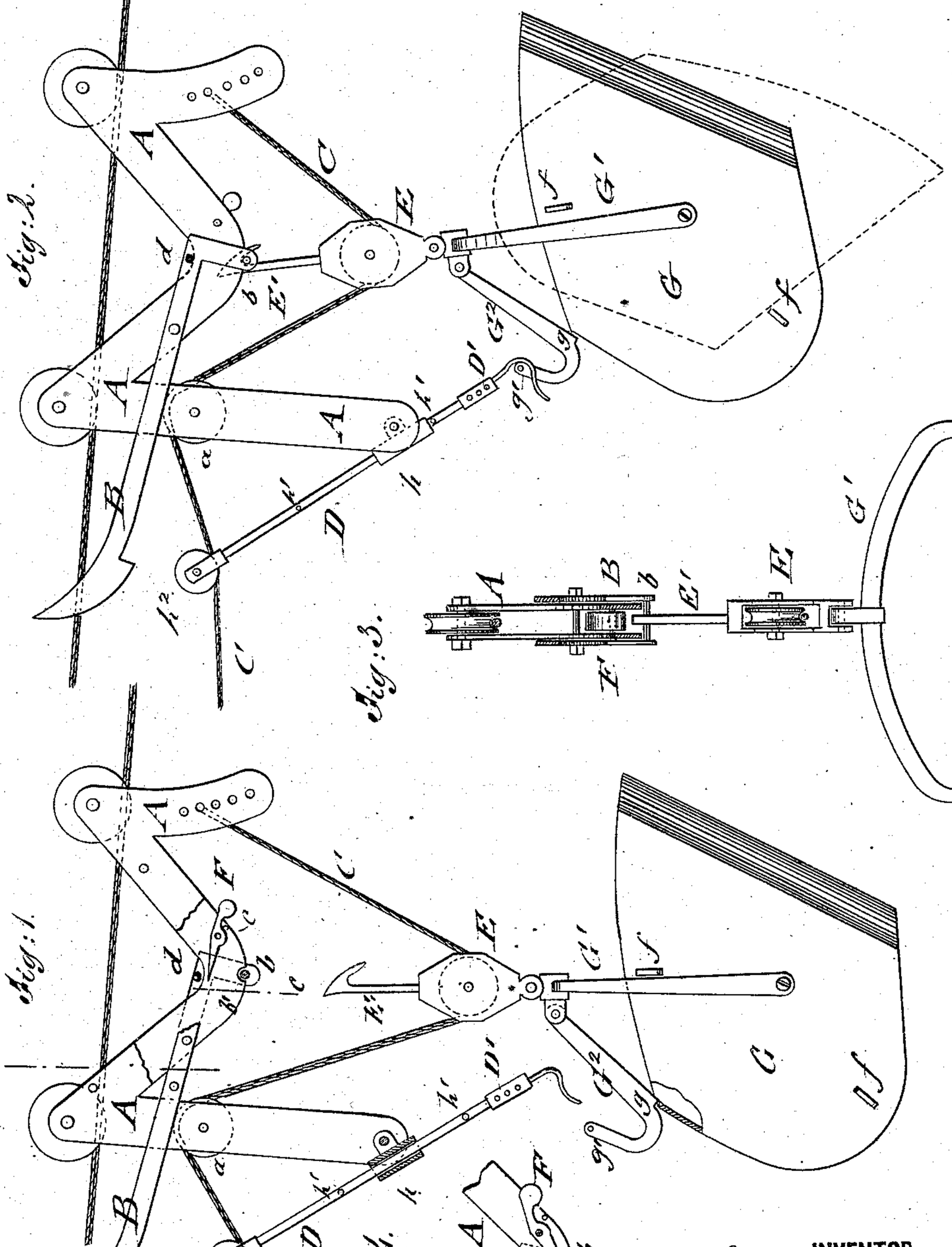
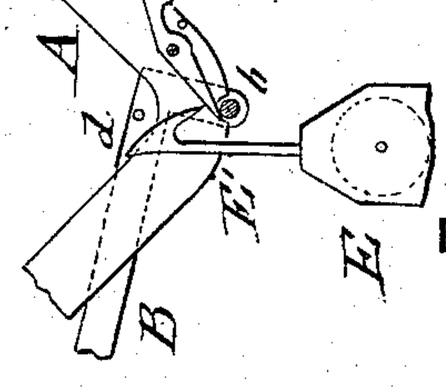


Fig: 3.

Fig: 1.

Fig: 4.



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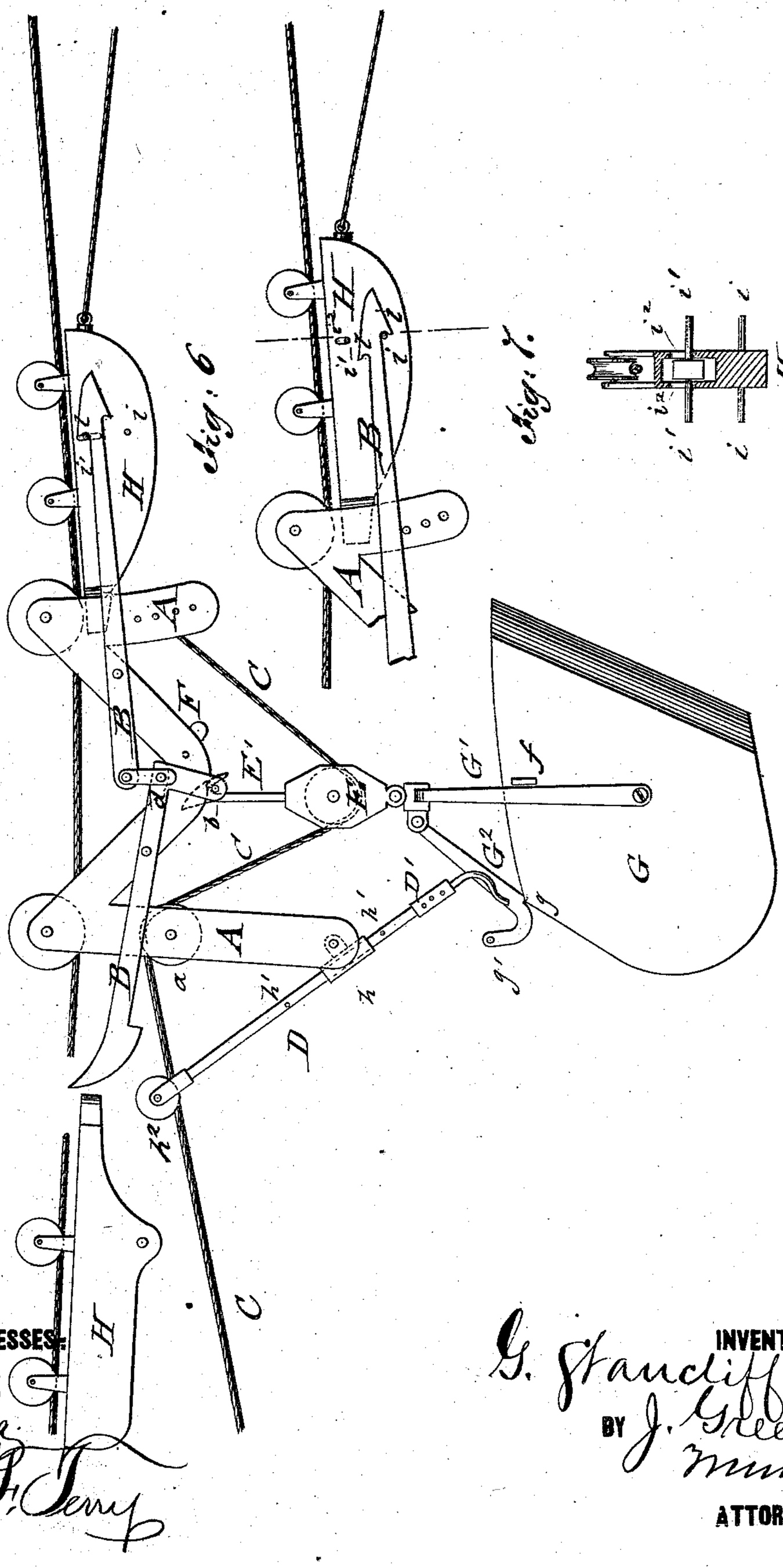

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UNITED STATES PATENT OFFICE.

GEORGE STANCLIFF AND JOSEPH GREEN, OF NEW YORK, N. Y.

IMPROVEMENT IN HOISTING AND CONVEYING COAL, &c.

Specification forming part of Letters Patent No. **161,175**, dated March 23, 1875; application filed March 1, 1875.

To all whom it may concern:

Be it known that we, GEORGE STANCLIFF and JOSEPH GREEN, of the city, county, and State of New York, have invented a new and Improved Apparatus for Hoisting and Conveying Coal, &c., of which the following is a specification:

In the accompanying drawing, Figure 1 represents a side elevation of our improved apparatus for hoisting and conveying coal, showing the bucket in the act of being hoisted. Fig. 2 is also a side elevation with bucket suspended from carriage. Fig. 3 is a vertical transverse section of the apparatus on the line *c c*, Fig. 1; Fig. 4, a detail side view of the mechanism for attaching and detaching the hook-shaped suspension-rod of the bucket to and from the carriage. Fig. 5 shows the apparatus adapted to be employed in any direction with adjustable carriage for the starting and end points; and Figs. 6 and 7, respectively, a detail side view and vertical transverse section on the line *c c*, Fig. 6, of the adjustable end carriage.

Similar letters of reference indicate corresponding parts.

Our invention relates to an improved apparatus for elevating and conveying coal and similar articles from any fixed or adjustable end point to another, being of simple construction and rapid and reliable in its operation; and it consists of a carriage moving on an inclined rail or wire way, and provided with fulcrumed lever-hooks and cross-pin for suspending the bucket thereon. An arrow or hook shaped suspension-rod of the pulley-blocks locks over the cross-pin of the levers, and is released therefrom by slightly hoisting the hook till it engages a weighted and pivoted guard-plate, which carries the hook below the cross-pin without engaging the same. The bucket is tripped for discharging its contents by detaching a latch-hook pivoted to its bail, and binding on the rear edge, by means of an adjustable and sliding trip-hook, which is pivoted to the carriage, and governed by the hoisting-cord of the bucket acting on a pulley at the upper end of the trip-hook rod. The fulcrumed lever-hooks are arranged at both ends of the supporting-carriage, and constructed with arrow-shaped or double-hooked ends, that lock on lugs or pins at fixed or movable end stations that define the length of the way. A sliding weighted cross-pin of the station serves to lock the upper hook of the fulcrumed levers on the arrival of the bucket, while the lower hook, arranged not vertically below, but nearer to, the end of the lever, locks over a lower fixed pin on the detaching of the bucket, being released by the weight of the resuspended bucket, and detached from the station as the upper hook raises the sliding pin, without engaging the same.

In the drawing, A represents a carriage of any suitable construction, and with fulcrumed locking latch-levers B at one or both ends of the same, by which the carriage is attached in the customary manner in this class of apparatus to the starting and end stations of its rail or wire way.

In the drawing the carriage is shown as being adapted to a wireway; but we do not confine ourselves specially thereto, as our improvements may be applied with equal facility to any carriage working on an inclined way.

The carriage A is hung and conveyed by grooved wheels on a strong wire-rope stretched at suitable degree of inclination, and constructed with a middle downward-extending bridge part for carrying the bucket thereon, and with downward-extending end arms, to the longer one of which the pulley *a*, for the hoisting-rope C and the bucket-tripping rod D, is pivoted, while to the other arm the end of the hoisting-rope is securely attached, but in such a manner that it may be adjusted vertically at greater or lesser height thereon, for allowing for different inclinations of the wireway. The hoisting-rope C passes from this fixed point of the carriage through the pulley-block E of the bucket, over the pulley *a* at the rear part of the carriage, to a windlass or other suitable hoisting apparatus, by which the bucket hung to the pulley-block is elevated and suspended on the carriage, to move therewith to the point of destination on the inclined way. The pulley-block E is provided with a vertical rod, E′, with arrow or hook shaped end, that enters the central part of the carriage, and engages a cross-pin, *b*, of the latch-levers B, which are fulcrumed

to the carriage in such a manner that the hook ends are heavier, and remain thereby locked to lugs or pins at the end stations. The opposite end of the latch-levers B is of elbow shape, the cross-pin *b* being attached at the lower end, and seated in a recess, *b'*, of the carriage, (shown in Fig. 1,) until the hook of the pulley-block engages the cross-pin, releases thereby the latch-levers, and starts the carriage.

The latch-levers B are supported, when the weight is suspended, by means of projecting pins *d* at their angular part, on the central part of the carriage, defining, with the cross-pin *b*, the extent of swinging motion of the latch-levers.

For the purpose of lowering the bucket a pivoted guard-plate, F, is applied at such distance from the cross-pin *b* of levers B that the tapering front end may swing down over the cross-pin, the rear end being weighted for carrying the guard-plate in upwardly-inclined direction against a stop-pin, *e*, Fig. 1. The suspension-hook of the pulley-block is slightly raised above the cross-pin until it strikes the guard-plate. The hook is then lowered, so as to carry the guard-plate down over the cross-pin, and slide thereby along the same past the cross-pin without any possibility of hooking thereon. The bucket is thus lowered for being charged and hooked readily to the cross-pin of the latch-levers on being hoisted again, the actual hooking or glancing off by striking the guard-plate being readily ascertained by feeling for it until the bucket is suspended and the carriage simultaneously released for forward motion. The swinging bail G^1 of bucket G is locked into position by means of side guard-lugs *f* and a latch-lever, G^2, pivoted to central part of bail, and binding, by a shoulder, *g*, on the rear edge of the bucket. A hook-shaped extension of the bail-lever G^2, with laterally-extending arms *g'*, is engaged by the adjustable trip-hook D' of rod D, which slides in a sleeve, *h*, pivoted to carriage A. The extent of sliding motion of the trip-rod D is defined by stop-pins h^1, the position of the rod being governed so as to engage the arms of the bail-latch by a pulley, h^2, at the upper end of rod D, which pulley rests on the hoisting-rope C.

When the loaded bucket has arrived at the point where it has to be discharged the sudden stoppage of the carriage stretches the hoisting-rope which has been unwound from the windlass, and carries thereby the trip-rod quickly in upward direction, so that its hook end detaches the bail-latch lever, producing, by the sudden jerky motion imparted to the bucket, the tilting over of the same on the bail, until the side lugs at the lower part strike the bail and arrest the tilting motion. The bucket discharges the coal or other contents during the tilting, and swings back to its former position in the bail. The hoisting-rope is then wound up, and thereby the carriage and bucket returned to the point of starting, to be lowered in the manner described for being charged again, when the operation of hoisting and conveying is repeated, the same being accomplished in very simple, reliable, and expeditious manner, so as to produce a considerable economy in the expense of conveying coal, ore, or other articles.

The fulcrumed levers may be arranged at one end of the conveying-carriage, as in Figs. 1 and 2, or at both, as shown in Fig. 5. They may be locked to fixed or movable end stations, as required, adjustable carriages H being used in case the distance to which the coal has to be conveyed is variable. The movable stations or carriages H have the additional advantage of being readily removed and placed in position at any desired point, which is more advantageous for temporary purposes in the place of permanent stations.

The movable stations are adjusted by ropes or otherwise to the required points on their supporting-way, the starting or end station, or both, being provided with fixed lower projecting lugs or pins *i* and upper sliding pins i^1, that move in slots i^2 of the station or carriage. The upper pins i^1 are weighted, as shown in Fig. 7, and are thereby seated in the lower parts of slots i^2 until raised.

The outer ends of the latch-levers B are provided with hooks *l* at the upper and lower side, the upper hook being at somewhat greater distance from the outermost end than the lower.

When the bucket-conveying carriage approaches the end station the ends of the latch-levers pass along the weighted pins and raise the same until they drop back of the upper hooks, and retain thereby the carriage in position. On the detaching and lowering of the bucket the weight is taken off the latch-levers, so that their outer ends drop, and lock thereby with the lower hooks on the fixed pins *i*. The resuspending of the bucket releases the lower hooks from the fixed pin, and detaches at the same moment the carriage from the station, as the upper hooks, having already passed beyond the weighted pins, cannot engage the same, as the pointed end part of the levers raises them, and acts as a guard to secure the exact and reliable working of the mechanism. The carriage may be locked and detached in the same manner at the opposite station, and thereby an automatically-working attaching and detaching device for any length of way be produced.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In hoisting and conveying apparatus, the combination of the bucket-suspending hook with the fulcrumed carriage-locking latch-levers, having lighter elbow-shaped front part with supporting cross-pins, for the purpose of attaching the bucket and releasing simultaneously the latch-levers for starting

the carriage, substantially as and for the purpose set forth.

2. The combination of the bucket-suspending hook with the weighted and pivoted guard-plate and the cross-pin of the latch-levers, for producing the release of the hook and the lowering of the bucket, substantially as shown and specified.

3. The sliding and pivoted trip rod and hook, operated by the hoisting-rope, in combination with the pivoted latch-lever of the bucket-bail, for tilting the bucket on releasing the latch-lever by the trip-hook, as specified.

4. The fulcrumed latch-levers, provided with hooks at the upper side, being at greater distance from their outer end than the hooks at the lower side, in combination with the sliding and weighted upper lugs or pins, and with the lower fixed pins of a stationary or movable end station, substantially as and for the purpose set forth.

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