

(No Model.)

2 Sheets—Sheet 1.

W. J. C. DOYLE.  
GRAVITY HOIST.

No. 430,073.

Patented June 10, 1890.

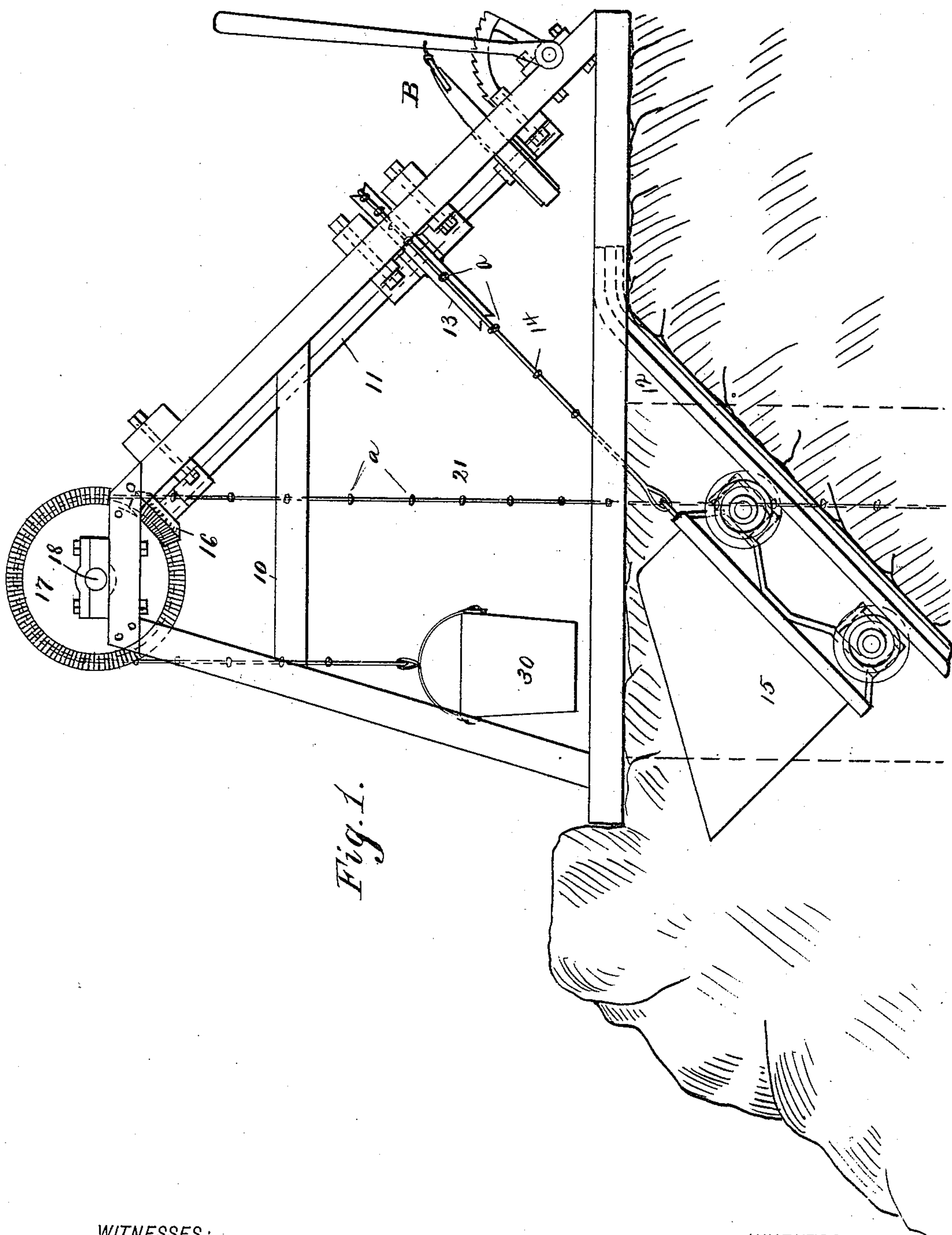


Fig. 1.

WITNESSES:

*J. Henry Thebrath.*  
*W. Sedgwick*

INVENTOR:

*W. J. C. Doyle*  
BY *Munn & Co.*  
ATTORNEYS

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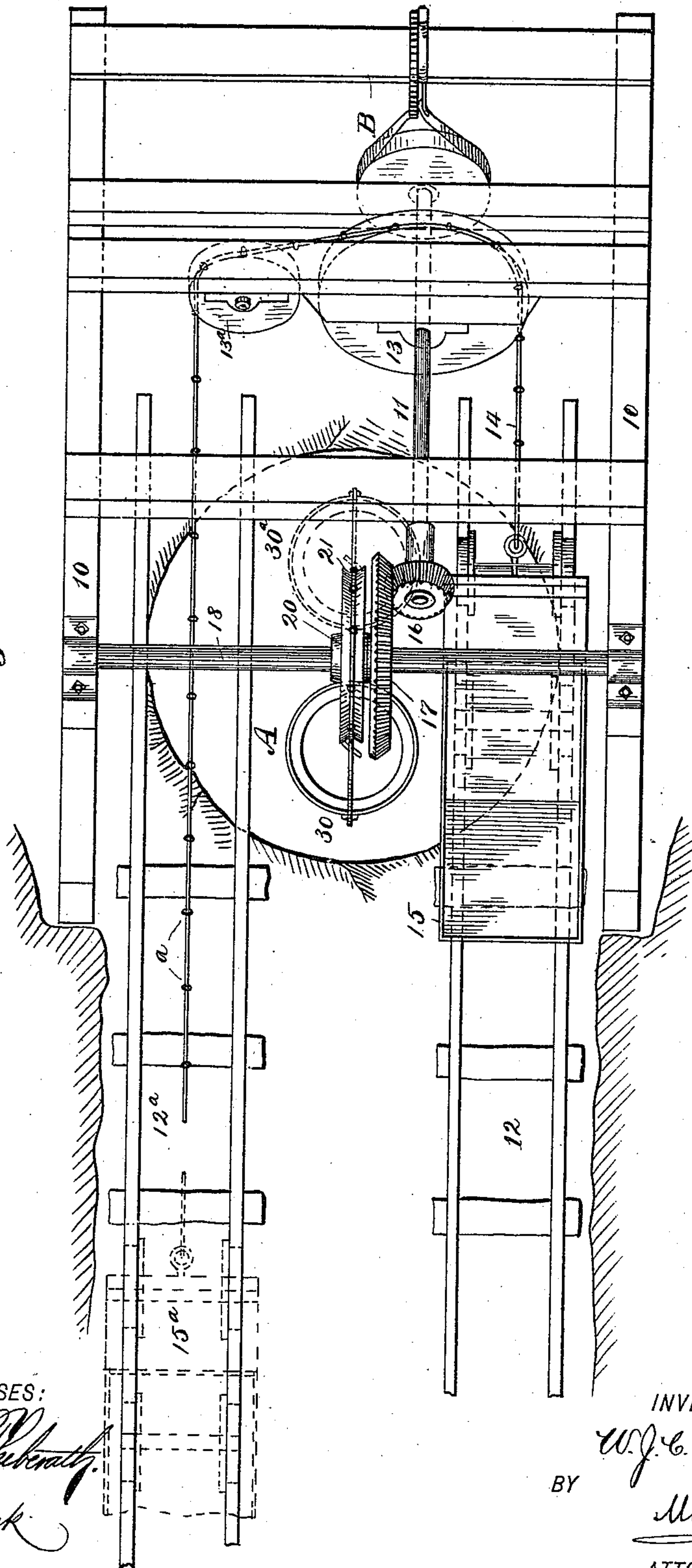


Fig. 2.

**WITNESSES:**

J. Henry P. Smith.  
C. Sedgwick.

***INVENTOR:***

BY *W. J. C. Doyle*  
*Munn & Co*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

WILLIAM J. C. DOYLE, OF ASPEN, COLORADO.

## GRAVITY-HOIST.

SPECIFICATION forming part of Letters Patent No. 430,073, dated June 10, 1890.

Application filed December 26, 1889. Serial No. 335,068. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM JOSEPH C. DOYLE, of Aspen, in the county of Pitkin and State of Colorado, have invented a new and Improved Gravity-Hoist, of which the following is a full, clear, and exact description.

This invention relates to hoists, the object of the invention being to utilize the force of gravity in the raising of filled buckets from the bottom of a pit or shaft, thus dispensing with the ordinary windlass, and, in fact, with any "power" except that of gravity.

In carrying out my invention I provide two inclined tracks or ways, upon which there are mounted cars that are connected by a cable, which said cable passes over a sheave carried by a power-shaft that is mounted in close proximity to the mouth of the pit or shaft. This power-shaft is provided with a small gear that engages a larger gear carried by a bucket-raising shaft, upon which there is keyed a sheave that supports a bucket-raising cable, a bucket being secured to each end of said cable.

In order that the movements of the parts may be controlled by the attendant, I provide one of the shafts with any proper form of breaking or retaining device.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in both the views.

Figure 1 is a side view of a hoist embodying my invention, and Fig. 2 is a plan view thereof.

In the drawings, 10 represents the main frame of the machine, in which there is mounted a shaft 11, that is preferably arranged so as to extend at right angles to the line of two inclined tracks or ways 12 and 12<sup>a</sup>. Upon this shaft 11, I mount a sheave 13, about which there is passed a cable 14, cars or trucks 15 and 15<sup>a</sup> being connected to the ends of the cable 14, which said cable is led directly from the sheave 13 to the car 15 and over a guiding-sheave 13<sup>a</sup> to the car 15<sup>a</sup>. The upper end of the shaft 11 carries a small gear 16, that engages a larger gear 17, mounted on a horizontal shaft 18, which said shaft extends over the pit or shaft A from which it is desired to hoist material.

Upon the shaft 18, and directly over the pit or shaft A, there is mounted a sheave 20, that supports a bucket-carrying cable 21, buckets 30 and 30<sup>a</sup> being connected to the ends of the cable 21. In connection with one of the shafts 11 or 18, but preferably in connection with the shaft 11, I arrange a brake mechanism, such as that shown at B, or any other proper brake mechanism.

In carrying out my invention I prefer to have the sheaves 13 and 20 about four feet in diameter, the gear 16 one foot in diameter, and the gear 17 two feet in diameter; but of course these proportions could be varied.

In describing the operation we will suppose that the car 15 is empty and is standing in the position in which it is shown in the drawings, and we will also suppose that the bucket 30 is filled and has been raised to a position so that it may be dumped into the car 15. When the bucket 30 and car 15 are in the positions in which they are shown, the bucket 30<sup>a</sup> will be at the bottom of the pit A and the car 15<sup>a</sup> will be at the lower end of its track or way 12<sup>a</sup>. Then after the contents of the bucket 30 have been dumped into the car 15 and the brake mechanism released such car will move downward on its inclined way 12, and in so moving will draw up the car 15<sup>a</sup> and the bucket 30<sup>a</sup>, which said bucket 30<sup>a</sup> is supposed to have been filled during the time it was at the bottom of the pit. When the car 15 reaches the lower end of its way, the bucket 30<sup>a</sup> will have been drawn to the surface and the car 15<sup>a</sup> will be in position to receive the contents of such bucket, and after this car 15<sup>a</sup> has been filled and the brake mechanism has been thrown off the reverse of the movement just described will take place.

To prevent the slipping of the cables 14 and 21, I provide such cables with stops *a*, that are arranged, preferably, about one foot apart upon the cable, and in the peripheral faces of the sheaves I form depressions adapted to receive such stops.

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

1. The combination, with an inclined shaft provided with a sheave that is arranged to be engaged by a car-supporting table, of a small

gear carried by such shaft, a horizontal shaft, a gear carried thereby and arranged for engagement with the gear of the inclined shaft, and a sheave carried by the horizontal shaft, such sheave being arranged to drive a bucket-carrying cable, substantially as described.

2. The combination, with an inclined shaft provided with a sheave that is arranged to be engaged by a car-supporting cable, of a small gear carried by such shaft, a horizontal shaft, a gear carried thereby and arranged for engagement with the gear of the inclined shaft, a sheave carried by the horizontal shaft, such sheave being arranged to drive a bucket-carrying table, and a brake mechanism, substantially as described.

3. The combination, with inclined ways, of cars arranged thereon, a cable by which the cars are connected, a sheave about which the cable passes, a shaft upon which the sheave is supported, a gear carried by said shaft, a horizontal shaft, a gear carried thereby and arranged for engagement with the first-referred-to gear, a sheave carried by the horizontal shaft, a cable arranged in connection therewith, and buckets carried by the cable, substantially as described.

WILLIAM J. C. DOYLE.

Witnesses:

J. J. DOYLE,  
BEN BOOTHBY.