(No Model.)

T. S. MILLER.

HOISTING AND CONVEYING APPARATUS.

No. 551,506. Patented Dec. 17, 1895.

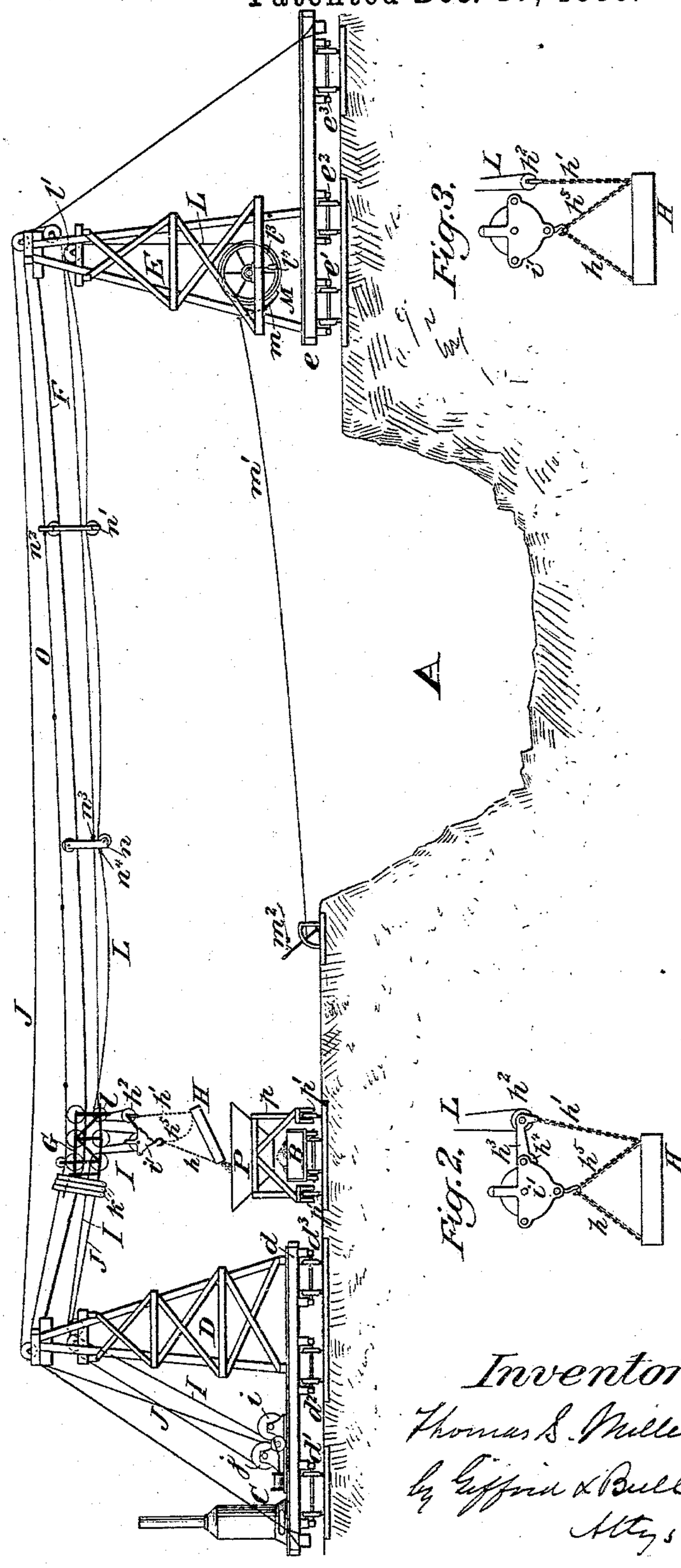

Fig. 1.

Fig. 3.

Fig. 2.

Witnesses:-
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HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 551,506, dated December 17, 1895.

Application filed May 26, 1894. Serial No. 512,582. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SPENCER MILLER, a citizen of the United States, and a resident of South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus, of which the following is a specification.

One part of my invention relates to a contrivance for dumping the load off the tray or bucket.

Another part of my invention relates to the support of the rope by which the dump is effected, which I will refer to as the "dump-rope."

Another part of my invention relates to the portability of the apparatus.

In the accompanying drawings I have shown, in Figure 1, an elevation of the apparatus as used for loading cars with material removed from an excavation. Fig. 2 is a detail, and Fig. 3 a modification.

A is the excavation.
B is the train of cars.
C is the engine.
D is the near tower.
E is the far tower.
F is the cable extending between the towers.
G is the load-carriage.
H is the load-tray.
I is the fall-rope.
J is the traveler-rope.

The load-carriage is run back and forth on the cable by the endless traveler-rope J, actuated by the rope-drum *j*. The fall-rope is actuated by the drum *i* and raises and lowers the fall-block *i'*.

The tower D and the engine C are mounted upon a platform *d* carried upon the trucks d' d^2 d^3 adapted to run upon rails parallel with the excavation. The tower E is mounted upon a platform *e* carried by the trucks e', e^2 and e^3 running upon rails parallel with the excavation. The fall-rope carriers *k* are constructed and operated similar to my Patent No. 521,035, dated June 5, 1894.

The tray or bucket H is permanently supported from the fall-block by the chains *h* and h^5. Opposite the delivery side the chain *h'*, depending from a separate fall-block h^2, is secured to the tray. The fall-block h^2 is adapted to be raised and lowered by the dump-rope L. So long as in lowering the load the fall-blocks *i'* and h^2 are lowered in unison, the load will not be dumped; but as soon as the lowering of the fall-block *i'* is continued, while the fall-block h^2 is stayed, the load will be dumped, as shown in the drawings, Fig. 1. It is therefore necessary to so control the dump-rope L that it will pay out or haul in in concert with the fall-rope I or will, when required, be fixed. This is accomplished by suspending the dump-rope L upon the sheave *l* of the carriage G and the sheave *l'* of the tower E, and thence extending the dump-rope L to the drum or reel l^3, upon the periphery of which it is fixed. The shaft upon which the reel l^3 is fixed suspends a weight l^4 in such a position as to tend to reel in upon the dump-rope L. M is a brake-shoe applied to the periphery of the reel l^3 and mounted upon a brake-lever *m*, which is connected to the rope *m'* with the hand-lever m^2. The weight l^4 is heavy enough to reel in the dump-rope L when the fall-rope I is reeled in. The weight l^4, however, is light enough so as not to prevent the descent of the empty tray or bucket H when the fall-rope I is paid out. It is evident now that when the bucket H is being lowered by the fall-rope I the dump-rope L will pay out in antagonism to the weight l^4 until the dumping-point is reached. Then by applying the brake M the further descent of the fall-block h^2 may be stayed so as to dump the load, or the load may be dumped under other conditions. Thus suppose the carriage to be traveling toward the tower D, supporting the load at a uniform height by the operation in unison of the traveler-rope J and the fall-rope I. The dump-rope L will follow the carriage and will be paid out by the reel l^3 in antagonism to the weight l^4 so long as the brake is not applied. If, however, the brake M be applied, so as to stay the rope L, the further forward movement of the carriage toward the tower D will cause the rope L to hoist the fall-block h^2 and dump the load.

In order that the reel l^3 may take up the dump-rope L when the load is being raised the weight of the dump-rope fall-block h^3 had better be taken off the dump-rope and sustained on the load fall-block. An arrangement which will answer for this purpose is

shown in detail in Fig. 2, where the block h^2 is secured upon the free end of the arm h^3 pivoted to the fall-block i'. The arm h^3 is provided with a downwardly-extending toe h^4, which bears against the side of the block i' and prevents the descent of the arm h^3 below the horizontal position shown in Fig. 2, but permits of its being raised into the upwardly-inclined position shown in Fig. 1.

A modification is shown in Fig. 3 where the tray is supported front and rear from the fall-block i' by the chains h and h^5, and the chain h' from the fall-block h^2 is also connected with the rear side of the tray H, but without the arm h^3. Other constructions may be employed.

I have discovered that it is desirable to support the dump-rope L along the span at stated distances as it is paid out. For this purpose I provide the dump-rope carriers n n' having rests for the dump-rope L, being supported in turn by the cable F. The dump-rope carrier n' being near the tower E will be supported upon a steeply-inclined portion of the cable F and therefore its own gravity may be depended upon to cause it to run out from the tower E when permitted to do so. The extent to which it is permitted to run out onto the cable is limited by the stop n^2 mounted upon a stop-rope O extending parallel with the cable F. The dump-rope carrier n being required to run out onto the portions of the cable which, being near the middle of the span, are more nearly horizontal, cannot depend upon its own gravity to run it out and therefore is held between a stop n^3 on the traveler-rope J and a stop n^4 on the dump-rope L. The stop n^3 urges the dump-rope carrier n to travel away from the tower E and the stop n^4 urges it to travel toward the tower E. At the same time, when the carrier n has been run in to the tower E as far as it will go, it does not obstruct the further movement in that direction of the traveler-rope J. Likewise, when the carrier n has been advanced toward or beyond the center of the span and the load-carriage comes to rest, it will not prevent the further travel of the dump-rope L in the same direction for the purpose of lowering the load.

By the construction above described the tray or bucket may be raised and lowered and caused to travel backward and forward and dumped at any desired point whether it be in the act of lowering or traveling, and all this can be done without requiring any attendant either at the bucket or on the load-carriage.

It being sometimes difficult to cause the dump to take place with precision within the width of an ordinary car, I prefer to provide a hopper P mounted upon a truck p bridging the car. The truck is supported upon wheels p' upon which the hopper may be shoved. By placing this hopper over the car, as shown in Fig. 1, as much latitude as may be desired may be afforded for the position of the dump.

I claim—

1. The combination of a cableway or track, a carriage traveling thereon, a drive rope for moving said carriage, means for driving the same, a skip or bucket sustained by said carriage, a dumping rope depending from said carriage and connected to the bucket, the reel l^3 for the dumping rope, the brake M and the weight l^4, substantially as described.

2. The combination of a cableway or track, a carriage traveling thereon, a drive rope for moving said carriage, a fall block i' and a skip or bucket sustained by said carriage, a dumping rope depending from said carriage, a sheave-block h^2 sustained by said dumping rope and connected with said skip or bucket, means at the end of the way for controlling said drive rope and said dumping rope to cause the dumping of the skip and an arm h^3 pivotally connected with said sheave-block and fall-block and provided with a stop h^4 whereby the weight of the dumping-rope-sheave-block is thrown upon said fall-block, substantially as described.

3. The combination of a cableway or track, a carriage traveling thereon, a drive rope for moving said carriage, a skip or bucket sustained by said carriage, a dumping rope depending from said carriage and connected to the bucket, means at the end of the way for controlling said drive rope and said dumping rope to cause the dumping of the skip, a series of dump rope carriers as n n' and means whereby the same are spaced upon the span, substantially as described.

4. The combination of a cableway or track, a carriage traveling thereon, a drive rope for moving said carriage, a skip or bucket sustained by said carriage, a dumping rope depending from said carriage and connected to the bucket, means at the end of the way for controlling said drive rope and said dumping rope to cause the dumping of the skip, a rope carrier as n, a stop n^3 on said drive rope and a stop n^4 on said dump rope whereby said rope carrier is moved in opposite directions, substantially as described.

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