T. S. MILLER.

HOISTING AND CONVEYING APPARATUS.

APPLICATION FILED AUG. 29, 1908.

1,000,537. Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

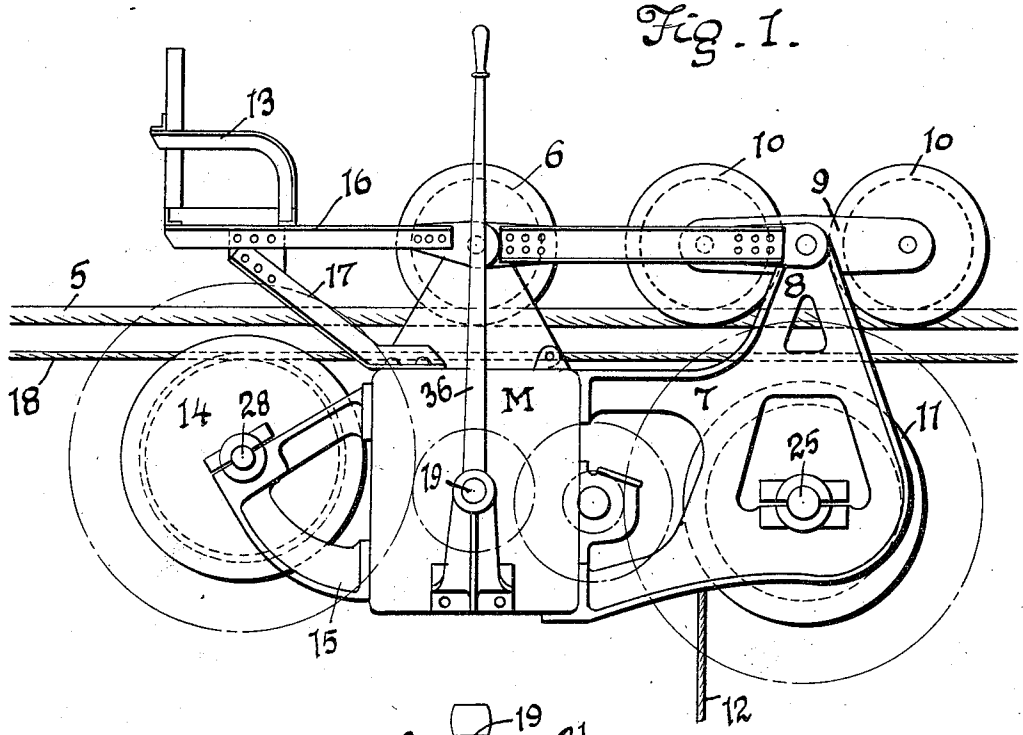
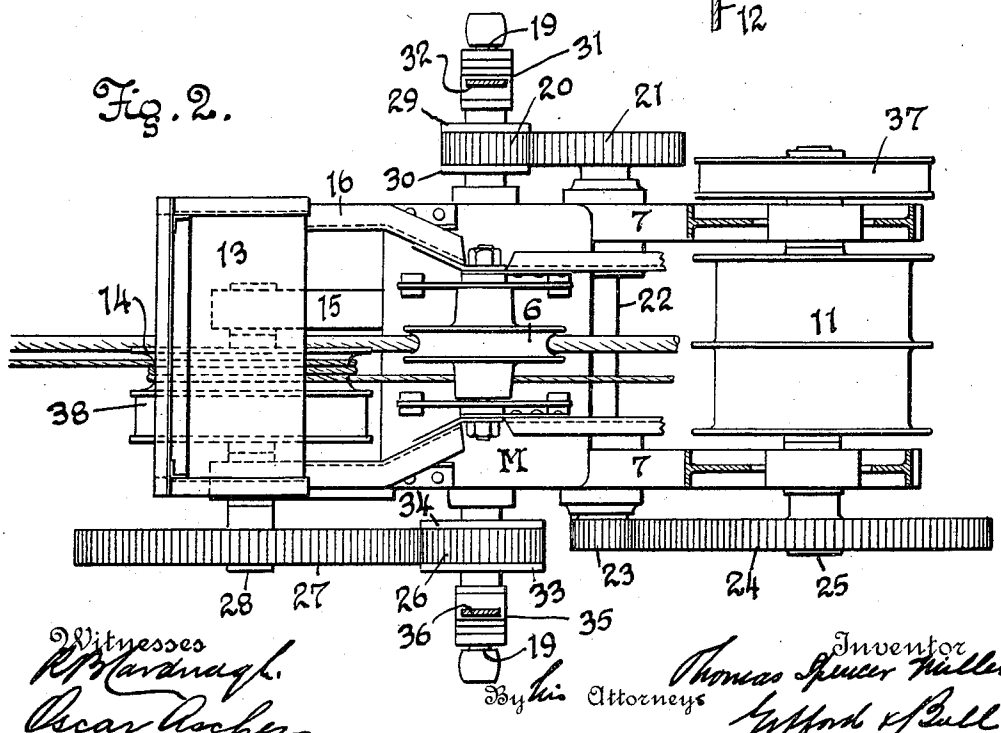


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

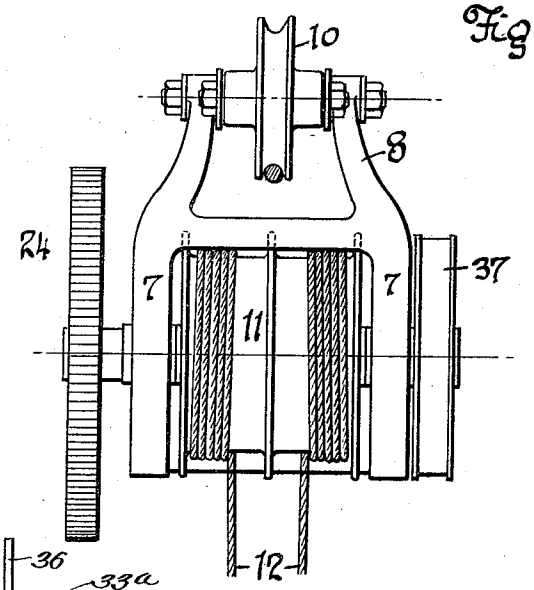


Fig. 5.

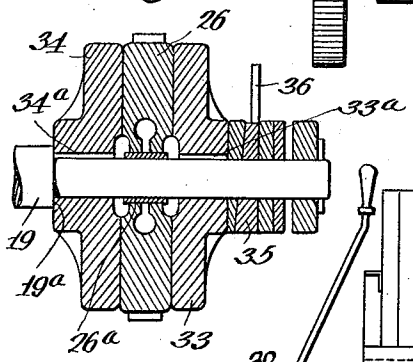
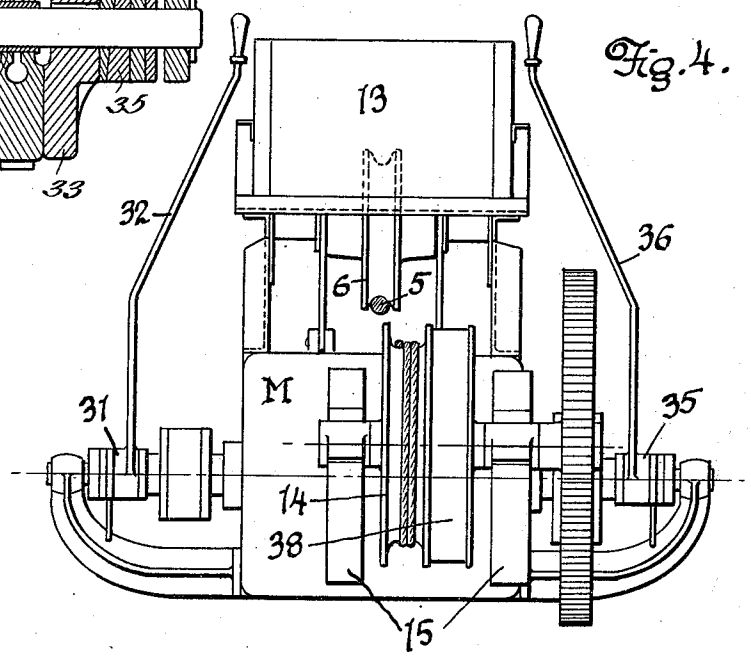


Fig. 4.



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HOISTING AND CONVEYING APPARATUS.

1,000,537. Specification of Letters Patent. Patented Aug. 15, 1911.

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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 a certain new and useful Improvement in Hoisting and Conveying Apparatus, of which the following is a specification.

My invention relates to hoisting and conveying apparatus and especially to a mechanism particularly adapted for use in conjunction with cableways.

In the accompanying drawings I have shown my invention embodied in the form which is at present preferred by me, but it will be understood that various modifications and changes may be made in the structure without departing from the spirit of my invention and without exceeding the scope of my several claims.

In my co-pending application Serial No. 434,068 I have shown a form of cableway in which the hoisting motor is mounted on the load carriage, and the conveying motor is located on the base of a tower supporting the cableway. In the present instance I have devised a novel arrangement wherein one motor is used, preferably mounted upon the load carriage, not only for hoisting, but also for conveying. Such a construction is particularly well adapted for the transportation of light loads and I obtain a simple, compact and economical arrangement for the purpose for which it is devised. It will be further noted that I suspend an electric motor from a single wheel running on the main cable, the motor being preferably located close to such cable. The armature shaft of the motor is also preferably extended from both ends of such motor and at each end of the shaft I mount a friction pinion, one friction pinion being geared to drive a single gear reduction to operate the conveying drum, the latter being provided with a curved face adapted to drive a rope rapidly thereabout, the ends of such rope being fixed at the terminals of the trackway. The pinion at the opposite end of the shaft drives, through the medium of a double set of gears, a drum for the purpose of hoisting the load. This latter, or hoist drum, is supported by means of a truck formed in the present instance, of a pair of wheels rolling upon the cableway, this construction insuring that the weight of the load will be supported directly by the cable.

My invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the several claims.

In the accompanying drawings, Figure 1 is a side view of the carriage and its connected parts, such view also illustrating a portion of the main cable, and a portion of the conveying and the hoisting ropes; Fig. 2 is a top plan view, a portion of the truck or carriage being broken away to more clearly show the hoisting drum; Fig. 3 is an end view showing the hoist drum; Fig. 4 is a face or end view showing the conveying drum, the preferred location of the operator's station, and the lever mechanism for controlling the conveying and hoisting mechanism. Fig. 5 is a detailed sectional view through one of the clutches for connecting the power shaft to the winding and hoisting drums.

Referring now to the accompanying drawings in detail, 5 designates the main cable which may be stretched between any two terminals or supports and secured or mounted in any preferred and well known manner. Traversing this cable is the truck or wheel 6 from which is suspended the motor M. Connected to the motor is the frame 7 having the sides 8 thereof extending above the cableway and pivoted to the truck 9 provided with the traction wheels 10, 10, said truck being especially adapted to support the hoisting drum 11 and the load car-

ried by the hoisting rope 12. It will be noted that I have provided the truck with a plurality of wheels, as the main load to be carried by the cableway is supported directly at this point.

13 designates the operator's station or seat, located upon the carriage above the cable 5, and preferably directly over the conveying drum 14, the latter being carried by brackets 15 secured to the frame of the motor M.

16 and 17 designate braces or struts for suitably supporting the operator's station or seat.

The conveying rope is indicated at 18, said rope having its ends or terminals suitably secured at the points of support of the main cable, and it will be noted that said conveying rope is wrapped several times about the conveying drum, so that when power is applied through the motor M, the carriage with its connected devices, may be propelled along the main cable.

It will of course be understood that power is imparted to the hoisting drum for the purpose of hoisting the load and to the conveying drum for the purpose of propelling the load through the agency of the motor M, and this is accomplished as follows: The numeral 19 indicates the armature shaft of the motor, the ends of said shaft projecting out and beyond the sides of the motor frame, as clearly shown in Fig. 2. Upon one end of the shaft is loosely mounted the pinion 20 meshing with the gear 21 secured to the shaft 22, the opposite end of said shaft carrying a small pinion 23, which latter is in mesh with the gear 24 at the end of the hoisting drum shaft 25. The opposite end of the armature shaft is also provided with a loose pinion 26 meshing directly with the gear 27, keyed to the end of the conveying drum shaft 28. Both the hoisting drum and the conveying drum are keyed directly to their respective shafts. It is my purpose to drive both the hoisting drum and the conveying drum from the armature shaft and to place the power transmitting mechanism interposed between said drums and shaft into and out of driving engagement with the motor, at desired times. In the present instance to accomplish this, I preferably proceed as follows: For instance, to drive the hoisting drum I provide, at the end of the armature shaft carrying the pinion 20 the friction plates 29 and 30, keyed or splined to the shaft and adapted to be shifted longitudinally of such shaft to place the pinion 20 into and out of operative engagement with the shaft. This shifting of the friction plates is accomplished by the thrust mechanism 31 actuated by the hand lever 32 conveniently located relative to the operator's station. Similarly, to place the conveying drum into and out of driving engagement with the arm of the shaft, I provide such shaft with the friction plates 33, 34, keyed or splined to the end of the shaft carrying the loose pinion 26, said plates being shifted into and out of engagement with such pinion through the medium of the thrust mechanism 35 actuated by the lever 36, under the control of the operator. It will of course be observed that as one or the other of the levers is moved to thrust the plates in toward the side of the motor, the inside friction plates 30 and 34, respectively, are fast upon the armature shaft, that is, are free to turn therewith, but have no movement longitudinally thereof, while the outer plates 29 and 33 are capable of longitudinal movement upon the shaft when actuated by their respective levers, so that when these plates 29 and 33 are shifted inward toward the motor frame by the thrust mechanism, the pinions 20 and 26 will be frictionally held by the pressure of the two plates, and, therefore, power may be readily transmitted.

The specific arrangement of the gears 20 and 26 and their clutching means is immaterial, as other means (not shown) may be employed for accomplishing the same result. I have shown, however, in Fig. 5 the specific arrangement of these parts in order that their arrangement and operation may be clearly understood. In this figure, which illustrates the gear for operating the propelling rope drum, the disk is shown arranged to abut a shoulder 19^a on the shaft 19, the shoulder serving to limit the movement of said disk along the shaft, the disk being keyed to the shaft by a key 34^a. The outer disk 33 is feathered to the shaft, as at 33^a, to slide longitudinally thereof in both directions, being moved against the gear, as above described, by means of the thrust mechanism 35—36. The gear 26 is slidably mounted upon the shaft and has interposed between its hub and said shaft a bushing 26^a. The same description applies to the gear 20 and the parts associated therewith.

While I have herein described my preferred form of clutch mechanism for the armature shaft, I wish it to be understood that I do not confine myself to the specific construction herein set forth, as other forms of clutch mechanism, either friction or otherwise, may be employed.

For holding the load in suspension when conveying such load, I provide the brake wheel 37, keyed to the hoisting drum shaft 25, such brake wheel being provided with a suitable and well known form of band brake, and similarly for holding the carriage in any position along the cableway I provide the brake wheel 38 secured to the conveying drum shaft 28, said wheel being also provided with any suitable and well known form of band brake.

It will be noted that with the construction

herein shown the weight of the load is not placed directly upon the motor, but is properly and suitably supported from the cableway, and, further, that with the motor located between the hoisting drum and the conveying drum and adapted to operate both drums, either independently or simultaneously, I provide an exceedingly simple, compact and durable construction of apparatus and one especially adapted for rope operation in the transportation of comparatively light loads.

I believe myself to be the first to devise a construction wherein is embraced a double friction pinion upon the motor shaft to drive in turn independently or simultaneously a hoisting drum and a conveying drum. It will further be noted that the operator is preferably located above the carriage where he is enabled to observe at all times the load and the machinery hoisting and conveying the same.

Having thus described my invention, what I claim is:—

1. The combination of a hoisting mechanism, a conveying mechanism, a motor shaft for operating both of said mechanisms, and independent means on said shaft for placing said motor shaft into and out of driving engagement with the hoisting mechanism and the conveying mechanism.

2. In a hoisting and conveying mechanism, the combination of a hoisting drum, a conveying drum, an electric motor, a motor shaft, independent power transmitting means between the shaft and said drums whereby the drums may be driven independently of each other, and independent means on said shaft for placing said motor shaft into and out of driving engagement with said drums as desired.

3. In a hoisting and conveying mechanism, the combination of a hoisting drum, a conveying drum, a motor, a motor shaft having its ends projecting beyond the motor, power transmitting means between one end of the shaft and the hoisting drum, power transmitting means between the other end of the shaft and the conveying drum, mechanism for putting said shaft into and out of driving engagement with the power transmitting means, and mechanism for putting said shaft into and out of driving engagement with the conveying drum.

4. In a cableway, in combination a supporting cable, a carriage, a motor on the carriage, a hoisting drum and a conveying drum on the carriage, gearing connecting the motor and said drums, and an operator's station and controlling means for the motor and drums located above the hoisting drums.

5. In combination with a trackway, a carriage having running wheels to travel on the trackway, a winding drum for a propulsion rope, and a hoisting drum journaled in the frame wholly below the trackway, a motor and a driving shaft on the carriage, means for connecting and disconnecting the driving shaft from said drums, and an operator station on the carriage and located wholly above the trackway.

6. In combination with a trackway, a carriage, propelling means for the carriage carried thereby, hoisting means on the carriage, a motor and a driving shaft, a driving connection on each end of the driving shaft and geared to the propelling and hoisting means, respectively, and independent means associated with each of said driving connections for causing the same to be driven by the driving shaft.

7. In combination with a trackway, a carriage comprising a frame extending longitudinally of the trackway, propelling means at one end of the frame, hoisting means at the other end of the frame, a motor between said hoisting and propelling means, a counter shaft geared to the hoisting means, a driving shaft driven by the motor, and independent connections on the driving shaft geared, respectively, to the propelling means and to the counter shaft.

8. In combination with a trackway, a carriage comprising a frame extending longitudinally of the trackway, propelling means at one end of the frame, hoisting means at the other end of the frame, a motor between said hoisting and propelling means, a counter shaft geared to the hoisting means, a driving shaft driven by the motor, independent connections on the driving shaft geared, respectively, to the propelling means and to the counter shaft, and means for clutching the connecting means to the driving shaft.

9. In combination with a trackway, a carriage comprising a frame having bearings extending above the trackway, traction rollers engaging the trackway and journaled in said bearings, a propelling drum mounted at one end of the frame and adapted to have a propelling rope wound thereon, a hoisting drum at the other end of the frame, a motor located between said drums, a driving shaft, independent gear connections between said driving shaft and drums, independent manually-operated means for rendering said gear connections effective to drive the drums, and an operator station located above the trackway.

10. In combination with a trackway, a carriage comprising a frame extending lengthwise of the trackway, bearings in the frame located above the trackway, traction members journaled in said bearings and engaging the trackway, a propelling drum located below the traction rope at one end of

the frame, a hoisting drum journaled in the frame at the other end thereof, said drums being located in substantially the same horizontal plane, a motor and a driving shaft carried by the frame and located between the drums, and independent gear connections for transmitting motion from the driving shaft to said drums, respectively.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

THOMAS SPENCER MILLER.

Witnesses:
ERNEST PULSFORD,
LOUIS G. RUGGLES.