(No Model.)

F. L. CHAMBERLIN.

HOISTING AND CONVEYING APPARATUS.

No. 419,583. Patented Jan. 14, 1890.

Fig. 2.

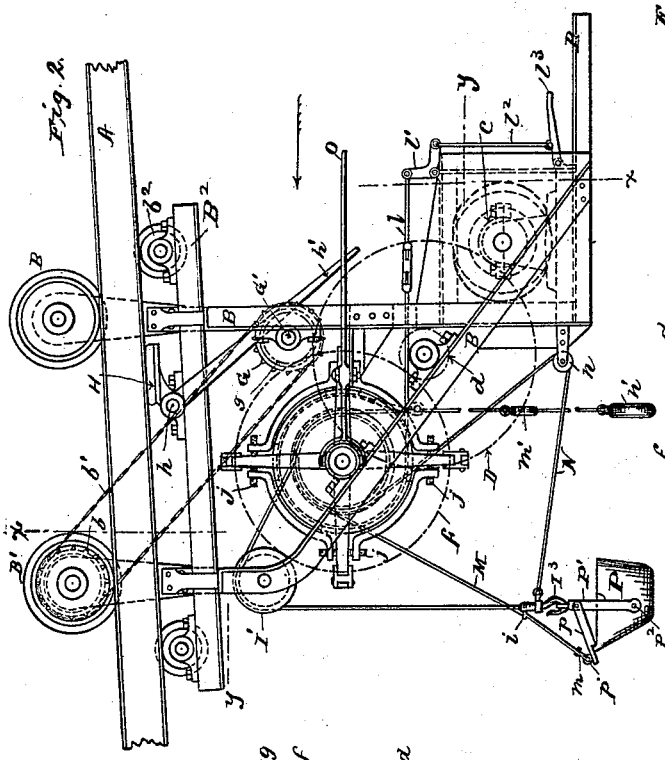


Fig. 3.

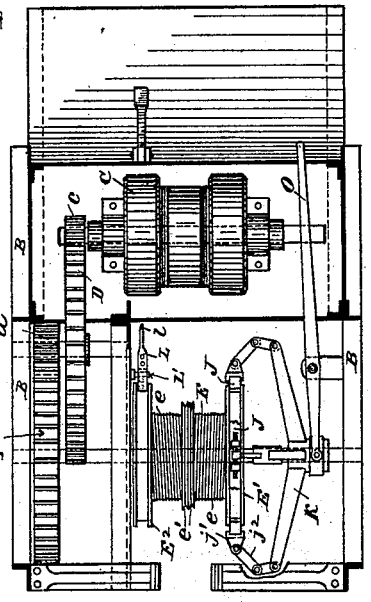
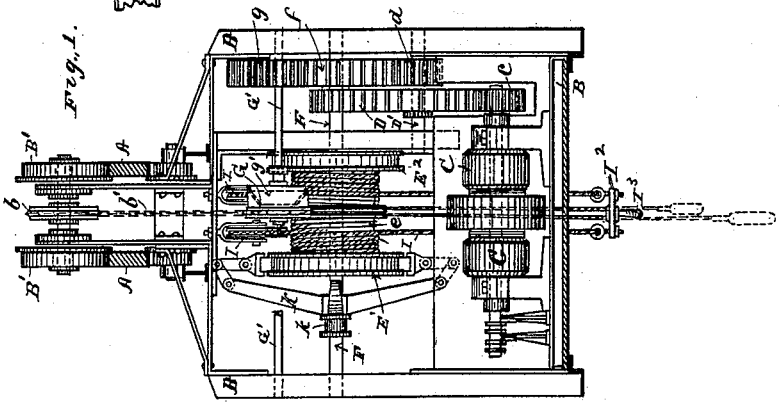


Fig. 1.



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UNITED STATES PATENT OFFICE.

FRANKLIN L. CHAMBERLIN, OF CLEVELAND, OHIO.

HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 419,583, dated January 14, 1890.

Application filed July 3, 1889. Serial No. 316,481. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN L. CHAMBERLIN, of Cleveland, in the county of Cuyahoga and State of Ohio, 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 pertains to make and use the same.

My invention relates to improvements in hoisting and conveying apparatus in which the motor, preferably electric, for propelling the carrier and for hoisting the load is located on the carrier, such motor operating traction-wheels of the carrier for propelling the carrier at least in one direction along the track. The bucket is hoisted by means of two cables operating on a single drum, the latter having spiral grooves, respectively right and left handed, for receiving the cables, whereby the load always maintains a central position between the tracks and the bucket is kept from rotating.

My invention also relates to the details of construction hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an end elevation, partly in section, on line *x x*, Fig. 2, looking in the direction of the arrow. Fig. 2 is a side elevation. Fig. 3 is a plan, partly in section, on line *y y*, Fig. 2.

A A are the track-rails of the truss, these track-rails having preferably such inclination that the carrier will travel in the one direction by gravity.

B represents the carrier-frame, constructed, preferably, of metal, and of such form as will accommodate the mechanism mounted thereon. The carrier is supported by wheels B′, traveling on tracks A aforesaid, the one set of wheels that support the most of the load being connected by an axle bearing a sprocket-wheel *b*, the latter being connected by endless chain *b′* with sprocket-wheel G.

C is a motor, preferably of the electric variety, the driving-shaft of the motor having mounted thereon pinion *c*, engaging gear D of shaft D′. The latter shaft has a pinion *d*, engaging gear *f* of the shaft F. Gear *f* also engages gear *g*, the latter being mounted on shaft G′, this shaft also supporting sprocket-wheel G aforesaid, the latter being mounted loose on the shaft and operated by means of friction-clutch *g′*.

Beams B^2, connected with the carrier-frame and extending lengthwise of the track-rails, are provided with suitable boxes, in which are journaled the axles of wheels b^2. These wheels engage or come close to the under side of the track-rails A and prevent the carrier from the possibility of tilting.

H is a friction-shoe engaging the under side of the opposing rail A. The shoe is pivoted at *h* and has connected therewith a hand-lever *h′*, the free end of the lever being within the reach of the operator. Shoe H serves as a brake frequently for stopping the carrier at a desired point, but is used more especially in controlling the movement of the carrier on the downgrade of the track-rails.

E is the drum on which the hoisting-cables I I are wound, this drum being mounted loosely on shaft F, with suitable collars or other device for holding the drum endwise on the shaft. At the one end of the drum is a friction-wheel E′, embraced by a sectional friction-band J, the different sections thereof being connected by bolts *j*. These bolts have right and left handed screw-threads engaging corresponding screw-threaded holes in the friction-band sections. Each bolt is provided with a short arm *j′*, and these arms are connected by links j^2 with the extremes of spider K. The spider-hub has an annular groove *k* for engaging the prongs of a forked lever O for shifting the spider endwise of the shaft, by which movement of the spider bolts *j* are turned a trifle, but enough to expand or contract the friction-band in loosening or grasping wheel E′. This friction-clutch is well adapted to the purpose, but is an old device, and I make no claim on this clutch, and hence it is not considered necessary to give a more detailed description of the same. The opposite end of the drum is provided with a friction-wheel E^2, embraced by a friction-band L of ordinary construction. The one end of the band is fastened, for instance, at L′, and the other end of the friction-band connects with rod *l*, the latter connecting with bell-crank lever *l′*, which in turn is connected by means of rod l^2 with treadle l^3. By depressing this treadle the brake-band is tightened

on the friction-wheel, the brake-band having sufficient elasticity to free itself from the wheel when the pressure on the treadle is removed. Drum E has spiral grooves *e*, respectively right and left handed, for receiving the respective hoisting-cables I aforesaid. These cables are fastened, for instance, at the extremes of the drum, in which case the cables approach each other as they are wound on the drum, by which arrangement the load is always kept in a central position relative to the track-rails, a matter of great importance, from the fact that these track-rails are likely to be separated but a short distance; also, by reason of two cables the bucket is prevented from whirling—that is to say, from revolving—as would likely be the case where but one cable is employed. The cables lead over sheaves I′ and connect with cross-bar I^2, the latter at the center thereof having attached hook I^3 for attaching the bucket. Preferably at the center of the drum are two circumferential grooves *e′ e′* for receiving, respectively, cords M and N. Cord M passes loosely through loop *i* of cross-bar I^2, the end of the cord having attached hook *m* for engaging loop *p* of catch *p′* for raising the latter in dumping the bucket. The other end of cord M is provided with a weight *m′*, the gravity of this weight being sufficient to hold the cord in position in the groove on the drum. The bucket P has the bail thereof P′ pivoted at P^2, and the catch aforesaid is hinged to the bail, the arrangement being such that the center of gravity in the loaded bucket is above the axis of the bucket and on the side opposite the catch. By drawing on the weighted end of cord M catch *p′* is raised, whereupon the loaded bucket is dumped by gravity. The bottom of the bucket is of such construction that the empty bucket "rights itself" by gravity. Cord N, known as "sway-line," connects with cross-bar I^2, and leads from thence around sheave *n*, and from thence passes over the drum in the same direction as cord M, cord N having attached a comparatively heavy weight *n′*. In hoisting the bucket, for instance, from the hold of the vessel, the cables do not always draw perpendicular, and hence the bucket is likely to swing in the direction lengthwise of the track-rails, and the draft on cord N caused by weight *n′*, aided by the friction of the cord on the drum, soon checks the swaying of the bucket.

Sheaves I′ I′, over which the hoisting-cables pass, are swiveled so that they can accommodate themselves to the lead of the cable in winding on or unwinding from the drum.

In operating the device, the motor being in motion to revolve the drum in the direction to wind up the hoisting-cable, lever O is shifted to apply the clutch, whereby the drum is set in motion for hoisting the load, and here I will remark that with the construction shown it is only necessary to hoist the load so as to clear any objects between the hoisting and dumping grounds, and as soon as the load is elevated sufficiently for such purpose the drum-clutch is loosened, and simultaneously therewith the drum-brake is applied and held by bearing upon treadle 13. Next, by means of friction-clutch *g′*, the sprocket-wheels are set in motion to propel the carrier along the track-rails to the dumping-ground. If the load has been elevated higher than necessary for dumping purposes, the load may be lowered before dumping by easing off on the treadle that controls the drum-brake, thereby lowering the load as far as practicable for dumping, and thus avoiding unnecessary breaking of material. This, for instance, in handling coal and various other commodities is a matter of importance. The operator, by drawing on the weighted end of cord M, lifts catch *p′*, whereupon the bucket dumps. If necessary, the empty bucket is elevated for the return travel, and in case of the inclined tracks the carrier returns to the hoisting-point by gravity, the downgrade movement of the carrier being controlled by applying friction-shoe H. In case of a level track provision is made for reversing the motor, so as to propel the carrier in either direction. An electric motor is preferable for the purpose, for the reason that it is of much less weight than, for instance, the steam-motor, which latter would necessitate a steam-generator located on the carrier, together with somewhat troublesome appliances for supplying such steam-generator with water. The electric wire and trolley for supplying the electric current to the motor may be substantially the same as employed on electric street-railways, and hence are not shown.

What I claim is—

1. In a hoisting and conveying apparatus, the combination, with an elevated track and a carrier suspended from the track, of a motor mounted on a carrier and a hoisting-drum supported on the carrier and located beneath the track, the motor being adapted to propel the carrier along the track and to actuate the hoisting-drum, substantially as set forth.

2. In a hoisting and conveying apparatus, the combination, with an elevated track and a carrier suspended from the track, of a motor and hoisting-drum supported on the carrier below the track, and suitable gearing, whereby the motor is adapted to propel the carrier along the track and to actuate the hoisting-drum, substantially as set forth.

3. In a hoisting and conveying apparatus, the combination, with a hoisting-drum and a dumping-bucket, of a dumping-catch and a suitable tension take-up for automatically taking up the slack dumping-line as the dumping-bucket is elevated, substantially as set forth.

4. In a hoisting and conveying apparatus, the combination, with an elevated track and a carrier suspended from the track and provided at a suitable point below the track with

an operator's stand or platform, of a motor and hoisting-drum supported on the carrier below the track, and suitable gearing, whereby the motor is adapted to propel the carrier along the track and to actuate the hoisting-drum, substantially as set forth.

5. In hoisting and conveying apparatus, the combination, with a carrier and a motor mounted on the carrier, of a hoisting-drum having spiral grooves on the face thereof, cables adapted to engage the respective spiral grooves, such cables being connected in common with the hoisting-bucket or other device for hoisting the load, and a brake for controlling the movements of the drum, substantially as set forth.

6. In hoisting and conveying apparatus, the combination, with an elevated track, a carrier suspended therefrom, a motor on the carrier, a hoisting-drum actuated by the motor, and a cable, of a sway-line connected to the hoisting device near the load, and leading from thence around a sheave on the carrier, and from thence preferably around the hoisting-drum in such a manner as to cause tension on said line, substantially as set forth.

7. In hoisting and conveying apparatus, the combination, with a carrier, a hoisting-drum, a cable, and a dumping-latch pivoted to the bail and adapted to engage the bucket, of a dump-line, the same being connected with the dumping-latch of the bucket being hoisted, such dump-line leading thence to a suitable tension and take-up groove on the drum, substantially as set forth.

8. In a hoisting apparatus, the combination, with elevated track-rails and a carrier having traction-wheels engaging the upper faces of said rails and wheels engaging the lower faces, of a motor mounted on the carrier below the rails, gearing connecting said motor with the traction-wheels, and a brake-shoe carried by the carrier and adapted to engage a track-rail.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d day of May, 1889.

FRANKLIN L. CHAMBERLIN.

Witnesses:
CHAS. H. DORER,
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