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PATENTED MAR. 13, 1906.

T. S. MILLER & J. H. DICKINSON.
HOISTING AND CONVEYING APPARATUS.

APPLICATION FILED NOV. 14, 1903.

2 SHEETS—SHEET 1.

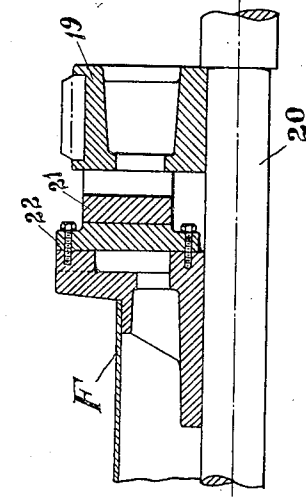
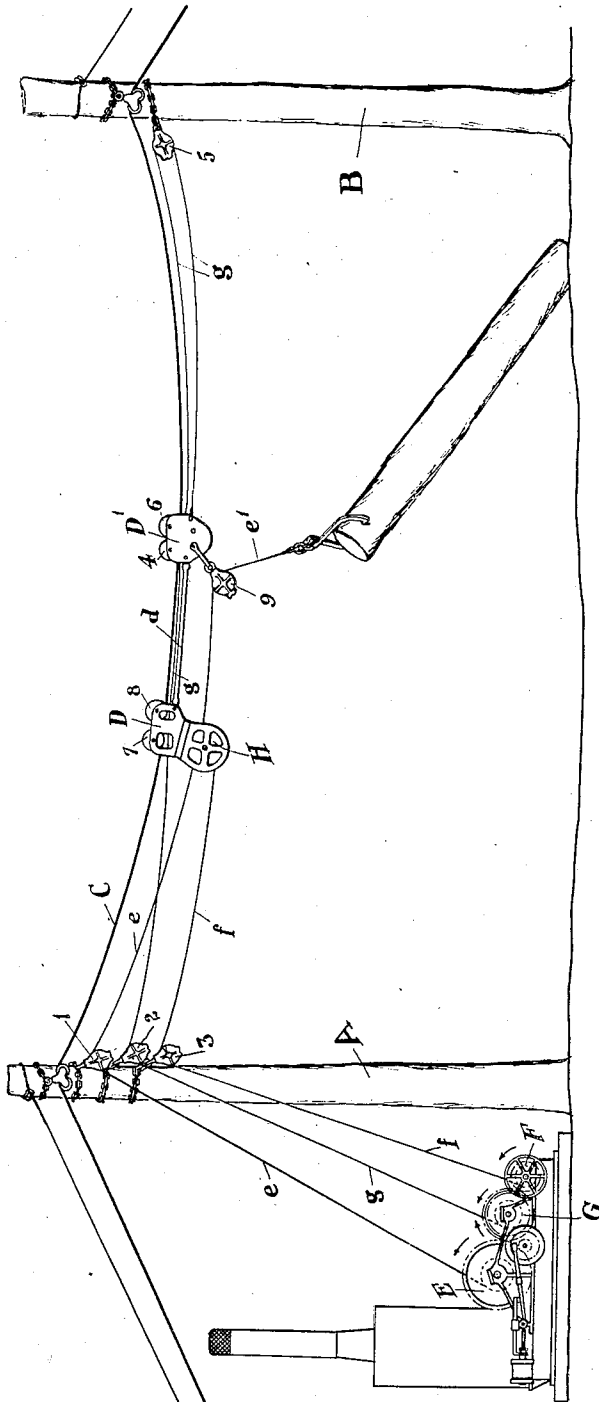


Fig. 5

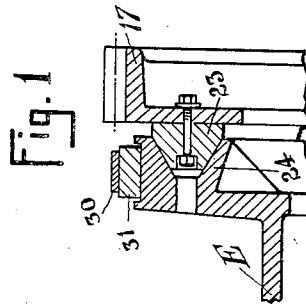


Fig. 6

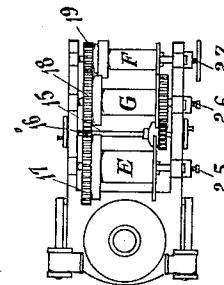


Fig. 4

Witnesses
Richard W. Seabury
Walter A. Pauling.

Thomas Spencer Miller and
Joseph H. Dickinson
By their Attorneys
Coffin & Bull

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2 SHEETS—SHEET 2.

Fig. 2

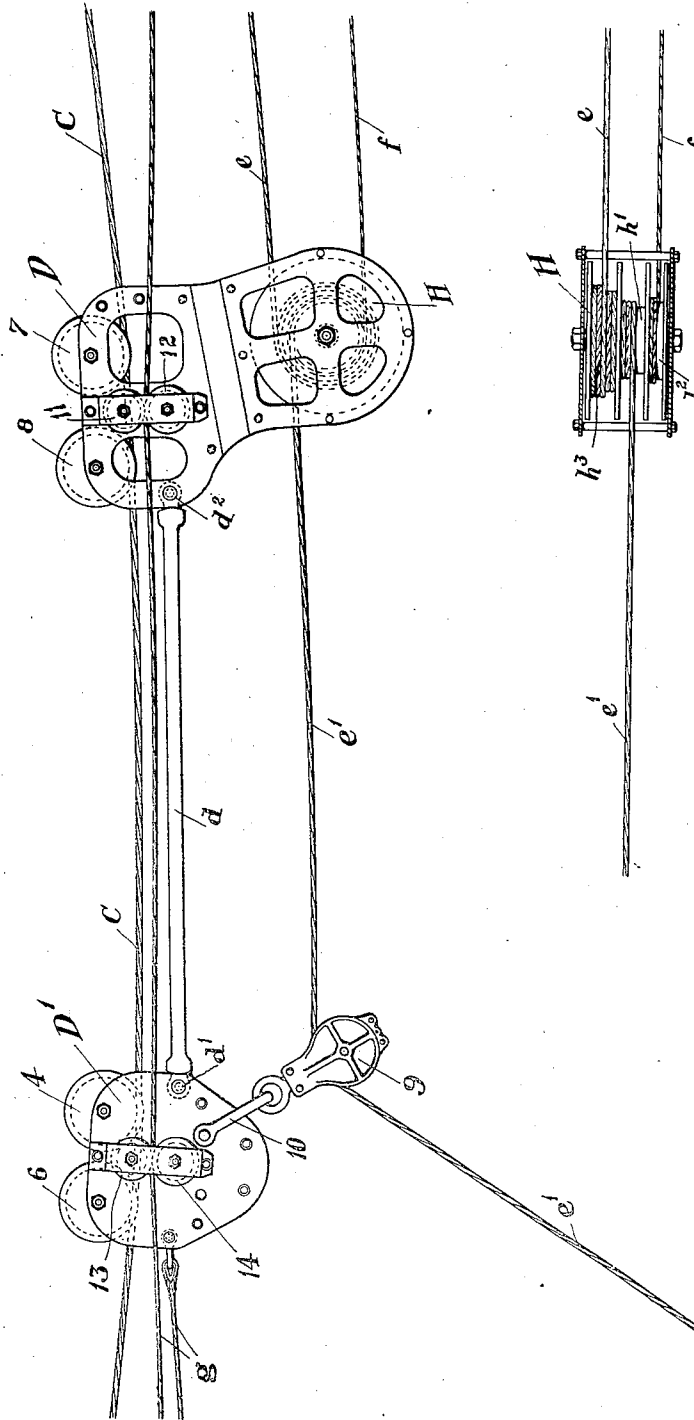
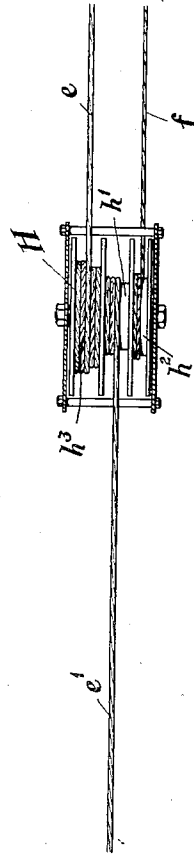


Fig. 3



Witnesses.
Richard W. Seabury.
Walter A. Pauling

Inventors
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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, AND JOSEPH H. DICKINSON, OF MONTCLAIR, NEW JERSEY.

HOISTING AND CONVEYING APPARATUS.

No. 814,717.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed November 14, 1903. Serial No. 181,203.

To all whom it may concern:

Be it known that we, THOMAS SPENCER MILLER, a resident of South Orange, and JOSEPH H. DICKINSON, a resident of Montclair, Essex county, State of New Jersey, citizens of the United States, have invented a new and useful Improvement in Hoisting and Conveying Apparatus, of which the following is a specification.

Figure 1 is a side view of an apparatus containing our invention adapted for logging. Fig. 2 is a detail view of our duplex load-carriage and the rope connections therewith. Fig. 3 is a detail view of the rope-drum H. Fig. 4 is a plan view of the rope-drum engine. Fig. 5 is a detail of the friction-surfaces by which the rope-drum F is operated. Fig. 6 is a detail of the friction-surfaces by which the rope-drums E and G are operated.

A and B are the head and tail supports.

C is the cable or trackway.

D D' is the duplex load-carriage.

E is the friction-operated hauling-rope drum of the engine. *e* is the hauling-rope operated thereby.

e' is the fall-rope.

F is the friction slack-pulling-rope drum of the engine.

f is the slack-pulling rope.

G is the friction outhaul-rope drum of the engine.

g is the outhaul-rope extending to the tail-support and back again and having its tail made fast to the carriage.

d is a connection between the two parts D and D' of the load-carriage, which preferably consists of a rigid rod pivotally connected at *d'* and *d''* with the frames of the carriage parts, so as to constitute substantially a distance member between said carriage parts. The connections at *d'* and *d''* are so constructed as to admit of a large amount of play and flexibility in all lateral directions, so as to give the carriages the greatest freedom of relative movement without permitting them to approach each other or separate.

1, 2, and 3 are guide-sheaves on the head-support.

5 is the guide-sheave on the tail-support.

7 8 and 4 6 are the wheels of the duplex load-carriage running on the cable or trackway.

H is the load-carriage drum composed of the plurality of parts *h* *h'* *h''*, of which preferably *h'* and *h''* are of equal diameter, while *h* is of smaller diameter.

9 is a fall-rope pilot-sheave linked by the clevis 10 with the carriage part D', so as to have freedom of movement both longitudinally and laterally.

11 12 and 13 14 are guide-sheaves journaled on one side of the carriage to steady the passing run of the outhaul-rope *g*.

15 is the driven shaft of the engine, which drives through the pinion 16 the spur-wheels 17 and 18, engaging by friction-clutches with the rope-drums E and G, respectively. The spur-wheel 18 drives the spur-wheel 19, fast on the shaft 20 of rope-drum F. The friction-clutch whereby the drum F is driven from the spur-wheel 19 consists of the segmental metallic friction-plates 21 and 22 of suitable composition to maintain while slipping upon each other a smooth and constant tension upon the ropes free from jerks. A good form of construction for this friction connection is shown in Patent No. 715,111, dated December 2, 1902. The friction-clutches operating the drums E and G will be of the ordinary wood 23 and iron 24 construction shown in Fig. 6 and provided with a brake consisting of the band 30, faced with wood 31.

25 26 27 are the screws by which the pressure of the friction-clutches is controlled.

When a log is being hauled in or lifted by the fall-rope *e'*, the hauling-rope *e* will be hauled in and the slack-pulling rope *f* be paid out under tension by the slipping of the surfaces 21 22. When the fall-rope *e'* is being carried out to take a new log, the clutch of the drum E is released and the rope *e* is outhauled by the inhaul of the rope *f*. When the duplex carriage D D' is propelled toward the head-support, the ropes *e* and *f* are both inhailed; but the speed of the drum F is sufficiently in excess of E to cause more or less slip between the surfaces 21 and 22. The weakness of the friction-clutch upon drum F as compared with that upon drum E insures that any tendency of said two drums toward a difference in speed of inhaul shall be compensated for by the slipping of said surfaces 21 and 22, so that the inhaul of the rope *f* is powerless to turn the drum H against the inhaul of the rope *e*. The hauling-rope *e* shares in part the burden of hauling in a log with the slack-pulling rope *f*. When the carriage D D' is being propelled toward the tail-support by the outhaul-rope *g*, both the ropes *e* and *f* are paid out under tension. The operator is enabled to maintain equality in the paying

out as between the ropes *e* and *f* by setting the surfaces 21 and 22 for a given amount of tension and then maintaining the friction-surfaces for the drum E at a comparative pressure which he sees is causing said ropes to run evenly. The distance of the pilot-hoisting-rope sheave 9 from the drum H is such as to give a sufficiently fair lead to the drum part *h'*, upon which said rope is coiled. The pilot-rope sheave 9 relieves the drum H from the lateral movements that are encountered in hauling logs from various directions.

Certain features herein shown and described are set forth in our still pending applications Serial No. 111,331, filed June 12, 1902, and Serial No. 127,788, filed October 18, 1902.

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

1. In a hauling apparatus, in combination, a cable or trackway, a carriage mounted to run thereon, a rope-drum mounted in said carriage, ropes for propelling said drum in opposite directions, stationary drums for actuating said ropes, clutches of different capabilities for actuating said drums, a fall-rope connected with the rope-drum of the carriage, and a pilot-sheave over which said fall-rope passes between the last-mentioned drum and the fall.

2. In a hauling apparatus, in combination, a traveling drum, ropes for driving said drum in opposite directions, fixed drums for actuating said ropes, a rope for connecting said traveling drum with the object to be hauled, and a pilot-sheave for the last-mentioned rope.

3. In a hauling apparatus, in combination, a traveling drum, two ropes for propelling the same in opposite directions, two stationary drums for actuating said ropes respectively, and two friction-clutches of different capabilities for actuating said two drums, respectively.

4. In a hauling apparatus, in combination, two stationary drums, a cable or trackway, a duplex carriage thereon, a rope-drum mounted on one part of the carriage and driven from the stationary drums, and a pilot-sheave mounted on the other part of the carriage.

5. In a hauling apparatus, in combination, a cable or trackway, a duplex carriage thereon consisting of separate frames with a connection between the same, a stationary drum mounted outside the carriage, a rope-drum mounted on one of said frames, and driven from the stationary drum, and a pilot-sheave on the other of said frames.

6. In a hauling apparatus, in combination, a cable or trackway, a duplex carriage consisting of separate frames connected by a distancing member, a rope-drum mounted on one of said frames, and means mounted out-

side the carriage for driving said rope-drum in opposite directions.

7. In a hauling apparatus a duplex carriage comprising separate frames, one of said frames having a rope-drum provided with a plurality of drum-barrels of different diameters, a second of said frames being spaced apart from the drum-carrying frame, and a connection between said frames.

8. In a hauling apparatus, a duplex carriage comprising a frame having a plurality of drum-barrels of different sizes, a second frame separated from the first-mentioned frame, a connection between said frames, and a swinging rope-support carried by the second frame.

9. In a hauling apparatus, in combination, a duplex carriage having a traveling drum, a rope connecting said drum with the object to be hauled, a pilot-sheave on the carriage for said rope, and means for propelling the drum in opposite directions.

10. The combination of two carriage members spaced apart, a rope-drum carried by one of said members, two ropes for driving said drum in opposite directions, two stationary drums for actuating said ropes respectively, and a swinging sheave secured to the second of the carriage members.

11. In combination, a traveling drum, a rope operated by said drum for connection with an object to be hauled, a pilot-sheave for said rope, two ropes having their tail ends at said drum and tending to operate the same in opposite directions and two stationary drums with which the head ends of said ropes are connected.

12. In combination, two traveling-drum parts connected in axial alinement, two stationary drums, a rope connecting each of said stationary drums with one of said traveling-drum parts to operate inversely, a rope operated by said traveling-drum parts for connection with an object to be hauled, and a pilot-sheave for said last-named rope.

13. In combination, three traveling-drum parts connected in axial alinement, two stationary drums, a rope connecting each of said stationary drums to one of said drum parts to operate inversely, a rope connected with said third drum part for connection with an object to be hauled, and a pilot-sheave for said last-named rope.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

THOMAS SPENCER MILLER.
JOSEPH H. DICKINSON.

Witnesses for Thomas Spencer Miller:

FRANK B. KNIGHT,
PRIOR SINCLAIR.

Witnesses for Joseph H. Dickinson:

D. R. WING,
B. B. TRUETT.