



No. 688,475.

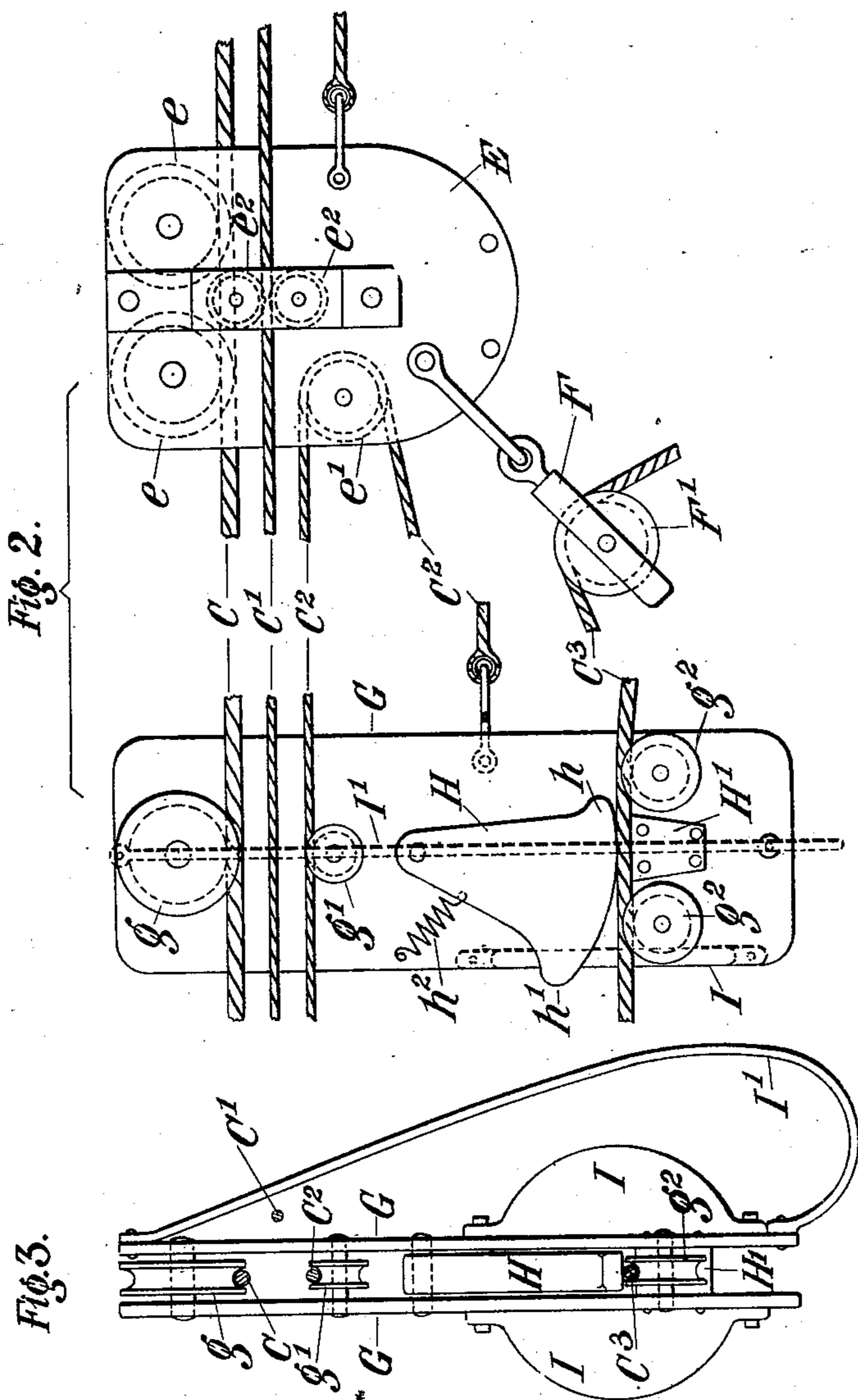
Patented Dec. 10, 1901.

T. S. MILLER & J. H. DICKINSON.  
CONVEYER.

(Application filed June 19, 1900.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses  
H. L. Reynolds.  
Chas. J. Rathjen

Inventors  
Thomas Spencer Miller.  
Joseph H. Dickinson.  
By their Attorneys  
Lufford & Buel

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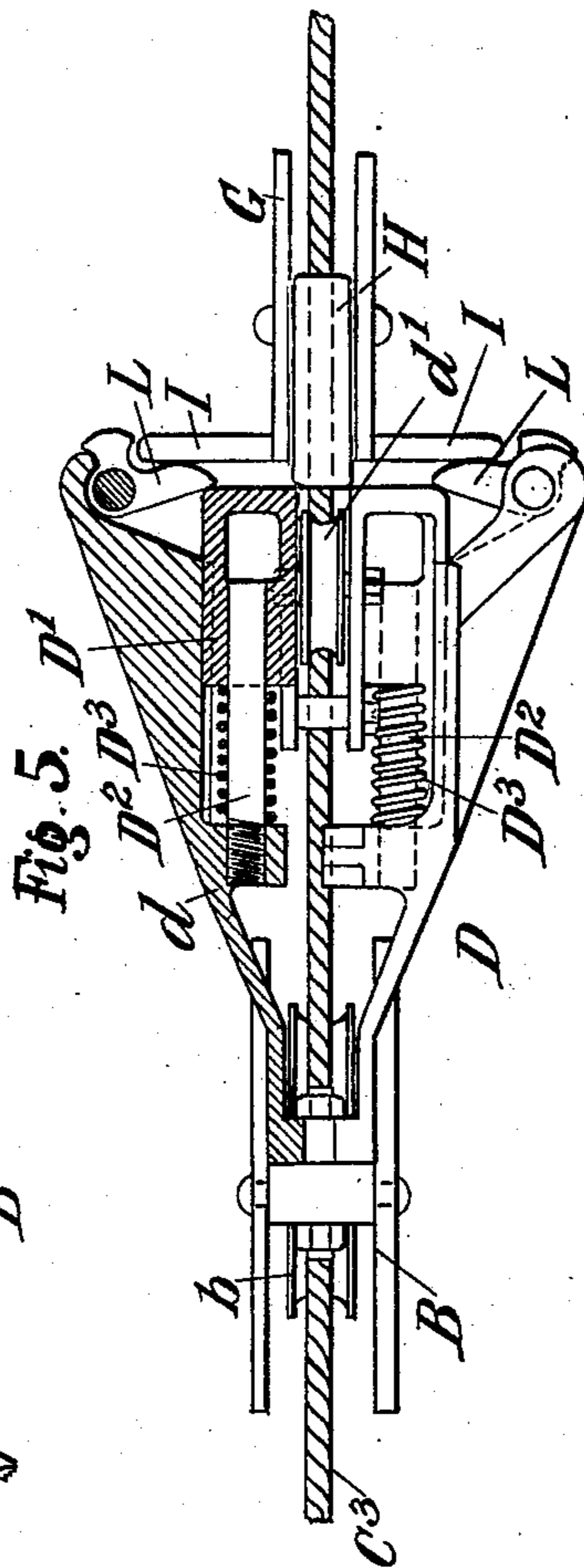
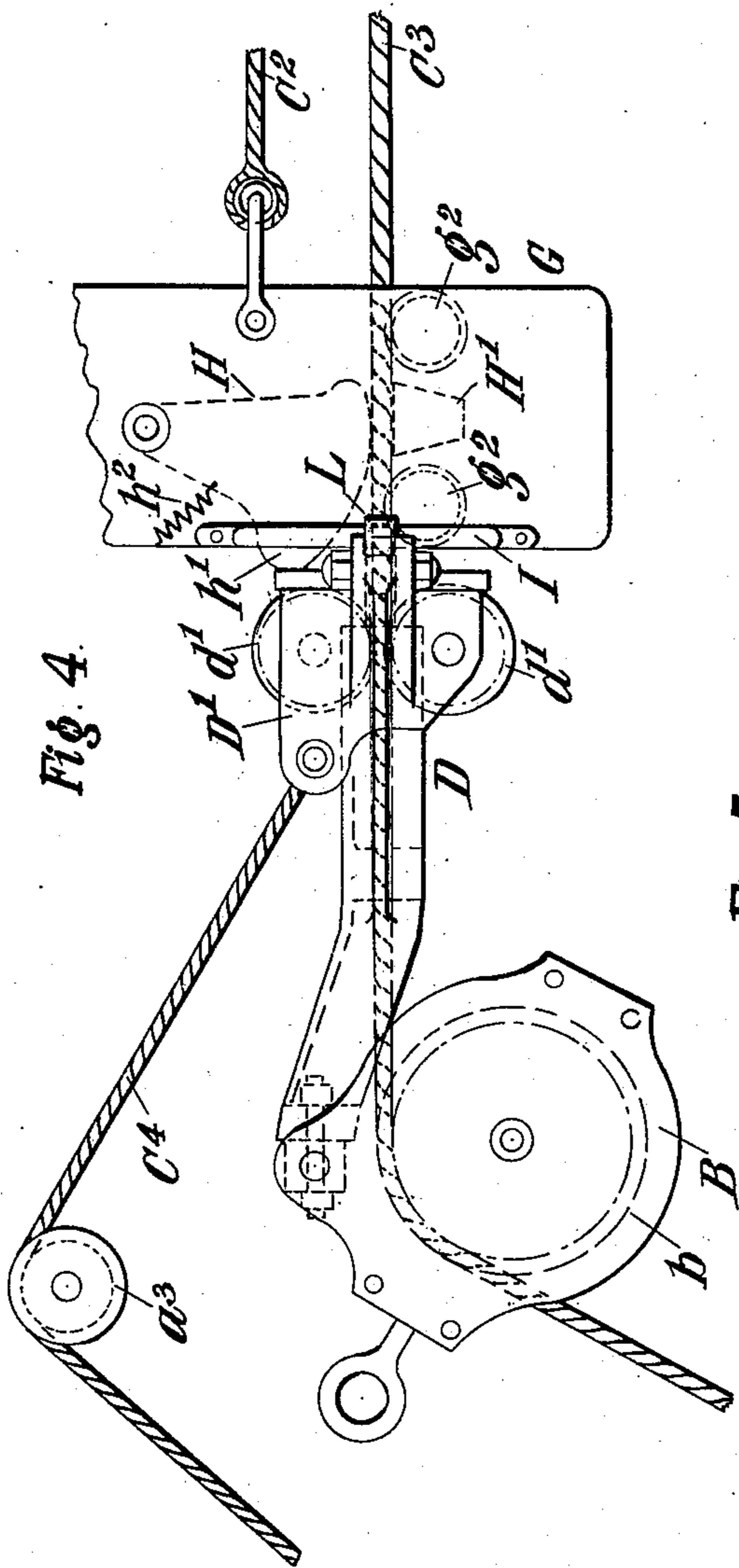
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**3 Sheets—Sheet 3.**



Witnesses  
H. L. Reynolds.  
~~Chas. J. Rushen~~

*Inventors.*  
Thomas Spencer Miller  
Joseph H. Dickinson.  
By their Attorneys  
Hoyt & Bull

# UNITED STATES PATENT OFFICE.

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

## CONVEYER.

SPECIFICATION forming part of Letters Patent No. 688,475, dated December 10, 1901.

Application filed June 19, 1900. Serial No. 20,796. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS SPENCER MILLER, a resident of South Orange, in the county of Essex and State of New Jersey, and JOSEPH  
5 H. DICKINSON, a resident of Atlanta, in the county of Fulton and State of Georgia, citizens of the United States, have invented a new and Improved Conveyer, of which the following is a full, clear, and exact description.

10 Our invention relates to an improvement in hoisting and conveying devices which are especially adapted for use in connection with cableways, although much of the device might be used in connection with a conveying  
15 mechanism employing a rigid track or without any track, the load-pulling and outhaul ropes serving as the only support other than the ground.

20 Our invention comprises certain novel features which will be hereinafter described, and particularly pointed out in the claims.

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

25 Figure 1 is an elevation showing the general operation of our device. Fig. 2 is a detail showing the carriage and the traveling grip in their relative positions when in use.  
30 Fig. 3 is an elevation of the traveling grip, taken at right angles to the view shown in Fig. 2. Fig. 4 is a side elevation of the trip and grip locking device with a portion of the grip, showing their manner of operation.  
35 Fig. 5 is a plan and partial section of the same parts.

Our device is herein shown as in use upon a cableway, although it will be evident that with only slight or no modifications the device might be used upon a conveyer having  
40 a rigid track, or the load-pulling and outhaul ropes may be used independently of any track, such modifications as might be necessary being of such a character as to be evident to any mechanic.

45 A head-support A and a tail-support A' are shown, which may be of any construction. Where the device is used for logging purposes, for which use it is especially designed,  
50 these head and tail supports would naturally be trees which were conveniently placed.

The cable C, upon which the carriage and the grip travel, is supported upon these head and tail supports and anchored in any convenient manner. An engine K is shown in Fig. 1  
55 provided with three drums  $k$ ,  $k'$ , and  $k^2$ , said engine being any convenient form of three-drum engine, such as is quite generally used for similar purposes, and is therefore not illustrated or described in detail. This engine, in addition to the usual devices, has a  
60 lever N, to which is connected a trip-rope  $C^4$ , by means of which the device which locks the grip near the head-support is released. The carriage, which is shown in Fig. 2, is in the  
65 main of any suitable construction. As herein shown, it consists of plates E, forming the frame of the carriage, in which are journaled two wheels  $e$ , which travel upon the supporting-cable C. The carriage is also provided  
70 with two guide-rollers  $e^2$ , which support the carriage outhaul-rope  $C'$ , and with a roller  $e'$ , about which the grip outhaul-rope  $C^2$  passes. To the lower part of the carriage is connected  
75 a clevis or sheave-frame F, in which is journaled a wheel  $F'$ , over which the hoisting-rope  $C^3$  passes. The grip G, which is shown in Figs. 2 and 3, has a frame composed of the two bars or plates G, in the upper end of which is journaled a wheel  $g$ , which travels upon the sup-  
80 porting-cable C and supports the weight of the grip. A guide-wheel  $g'$  is also provided within the frame, upon which travels the grip outhaul-rope  $C^2$ . Between the lower ends of the plates forming the frame of the grip are  
85 journaled two wheels  $g^2$ , over which travels the hoisting-rope  $C^3$ . Between these two wheels and beneath the rope  $G^3$  is placed a block  $H'$ , which forms an abutment for the rope to enable the grip, or dog H to engage  
90 and bind the same. This dog H is pivoted at its upper end between the frame-plates G of the grip and has its lower end surface curved with a varying radius from its pivot-point, the end  $h$  of said curved surface being  
95 of a greater radius than the end  $h'$ , so that when it swings to the position shown in Fig. 2 it will firmly grip the rope  $C^3$  against the block  $H'$ . In this condition when the rope  
100  $C^3$  is caused to travel toward the left in Fig. 2 it will carry the grip with it, or if the grip is caused to travel toward the right, as shown

in Fig. 2, it will carry the rope  $C^3$  with it. A spring  $h^2$  is connected with the cam-dog H, so as normally to draw it into its locking position with a slight pressure sufficient to cause its prompt engagement with the rope. The block H' would ordinarily be placed below the wheels  $g^2$  enough to prevent the hoisting-rope from engaging therewith when running out or when the dog H is out of use.

Upon the outer surfaces of the two frame-plates of the grip G and at their edges, which are toward the head-support, are placed two flanges I, which are adapted to be engaged by the grip-locking mechanism carried upon the trip, which trip is supported on or near the head-support. The grip outhaul-rope  $C^2$  is connected to the grip, as shown in Fig. 2. This grip outhaul-rope passes first to the carriage E and then backward toward the head-support to its engagement with the grip G. Upon one side of the grip a curved bar I' is shown, which forms a guide to retain the carriage outhaul-rope  $C'$  in place and prevent its becoming entangled.

The mechanism for tripping and holding the grip is shown in Figs. 4 and 5. The hoisting-cable  $C^3$  passes over the pulley  $b$  of a sheave-block B, which is supported upon the head-support. The trip which provides for releasing the grip from the hoisting-cable is herein shown as connected with the sheave-block B, although it is evident that it may be supported from any other suitable member. In case it was desired to release the grip at a greater distance from the head-support the trip D might be supported from the supporting-cable. The frame of this tripping and grip-holding device consists of two parts D, which at their outer ends or the ends away from the head-support flare outwardly, as clearly shown in Fig. 5. Within this outer end of the frame is mounted a sliding block or ram D', which is mounted to slide in suitable guides on the frame D and the bolts  $D^2$ , which bolts are also surrounded by springs  $D^3$ , acting to hold the block projected a certain amount and to return it after it has been forced inward. To the block D' is connected a rope  $C^4$ , which passes over a pulley and downward to the lever N upon the engine, by means of which the operator may withdraw the block  $D^2$  whenever desired. The outward movement of the ram or block D' is limited by engagement with the ends of the bell-crank levers L, which act at different times as stops for the ram D' and catches for the rope-grip. The cam-dog H upon the grip has its end  $h'$  projecting beyond the side edge of the grip-frame and in such position that as it travels toward the trip it will finally engage with the outer end surface of the block D', and the grip will thus be released from the hoisting-cable by forcing the dog toward the right of its position, as shown in Fig. 4.

Upon the outer ends of the frame D of the trip are pivoted two bell-crank levers L, the longer or inner ends of said levers being of

sufficient length to engage with the outer end surface of the block D'. The flanges I, which project from the sides of the grip, engage the inner arms of these bell-crank levers before the cam-dog H engages the block D'. The block D' is thus forced inward before it engages the cam-dog H a sufficient amount to free the hoisting-rope. As the block is swung inward by the pressure applied to the bell-crank levers L the springs  $D^3$  are compressed. When it has been swung inward a sufficient amount, the long arms of the bell-crank levers will swing outward a sufficient amount to clear the block D'. The block will then be forced outward by the springs  $D^2$  and will strike the cam-dog H a blow sufficiently hard to promptly release the hoisting-rope. When the ram D' is forced outward, the inner long ends of the catch-levers L lie outside the ram and are prevented thereby from swinging back of the position shown in Fig. 5. In this position the short arms of the levers hook over the outer edges of the flanges I, so as to hold the grip against return. The grip will thus be held until the block D' is withdrawn by hand through the intervention of the rope  $C^4$ . As soon as this occurs the spring  $h^2$  will cause the cam-dog H to grip the hoisting-rope  $C^3$ . If the drum carrying the grip outhaul-rope  $C^2$  is caused to turn so as to wind its rope in, the grip will be caused to travel toward the right of the figures and to carry with it the hoisting-rope  $C^3$ . The hoisting-rope is guided in its passage through the trip device D by means of two rollers  $d'$ , which are journaled in said trip device.

The operation of our device is as follows: Starting with the grip G locked to the trip mechanism (shown in Figs. 4 and 5) the engine is operated so as to cause the carriage E to travel outward upon the cableway. As the outer end of the hoisting-rope  $C^3$  is provided with a pair of tongs  $f$  or other suitable mechanism for engagement with the log, the end of the hoisting-rope cannot pass through the pulley F' and the hoisting-rope is carried out along with the carriage. The grip outhaul-rope  $C^2$  is also carried out by the same means, although the speed of the grip outhaul-rope will be twice that of the carriage and the hoisting-rope, because one end of it is secured to the grip, and the grip is at that time locked in position and prevented from traveling outward upon the cableway.

In using a device of this character it is desired to have a certain amount of the hoisting-rope extending beyond the carriage, so that logs may be drawn in from points extending at some distance at either side of the cableway or beyond the tail-support. When the carriage has traveled a distance from the locked position of the grip equal to the amount of the hoisting-rope which it is desired to have extend beyond the carriage, the trip is released by pulling upon the rope  $C^4$ . The further travel of the carriage will thus result in drawing the grip outward with it, provided

the friction of the grip in traveling upon the cableway is less than the friction of the drum upon which the grip outhaul-rope is wound. This may be regulated by a brake, if necessary. The grip may also be caused to travel outward by winding in upon the grip outhaul-rope. By one of these means the grip is caused to travel outward upon the cableway, so as to pull with it the hoisting-rope, and thus to provide as much slack as necessary to reach the logs desired. If the amount of slack produced by this means is not quite sufficient for the purpose, it is a comparatively easy matter to pull out the hoisting-rope the short distance desired by hand, as the grip will not engage the hoisting-rope except it is moved in one direction.

The rope C<sup>3</sup> has herein been called a "hoisting-rope," although it is something more than that. It is, in effect, a combined hoisting and load-pulling rope, as the travel of the carriage toward the head-support is caused by the pull upon the rope C<sup>3</sup>. We have therefore in some of the claims referred to this rope as a "load-pulling" rope, which is correct, as it is relied upon to move the carriage in one direction.

It is evident that our device might be operated without the main or trackway cable C, if desired, although the use of such cable has some advantages. In such case the outhaul and hoisting ropes would serve in combination as the supporting-ropes. The carriage, the grip, and the tripping and holding devices might be much simplified without departing from the spirit of our invention or changing their function.

It is evident that many of the parts of our device might be materially changed in appearance without changing their essential characteristics. We do not, therefore, wish to be limited to the exact form of device herein shown nor to the exact method of operating the same. The omission of any elements in any claim is to be taken as a formal declaration that the omitted elements are not essential to the particular combination therein mentioned.

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

1. In a conveying device in combination, a load-pulling rope, a carriage, carriage-traversing means, an outhaul-rope, and a grip actuated by said outhaul-rope and adapted to engage the load-pulling rope to draw it outwardly.

2. In a conveying device in combination, a load-pulling rope, a load-carriage, carriage-traversing means, an outhaul-rope, a grip actuated by said outhaul-rope and adapted to engage the load-pulling rope to pull it outward, and means for automatically releasing the grip when it reaches a certain inward position.

3. In a conveying device in combination, a load-pulling rope, a load-carriage, carriage-traversing means, an outhaul-rope, a grip ac-

tuated by said outhaul-rope and adapted to engage the load-pulling rope to pull it outward, and a trip adapted to contact with and release the grip from the load-pulling rope, at a certain point in the inward travel of the grip.

4. In a conveying device in combination, a load-pulling rope, a carriage, carriage-traversing means, an outhaul-rope, a grip secured to said outhaul-rope and adapted to engage the load-pulling rope to pull it outward, and a trip and holding device adapted to both free the grip from the load-pulling rope and to hold the grip.

5. In a conveying device in combination, a load-pulling rope, a carriage, carriage-traversing means, an outhaul-rope, a grip secured to said outhaul-rope and adapted to engage the load-pulling rope, to pull it outward, and a combined grip freeing and holding device located inwardly from the extreme travel of the load and adapted to automatically free the grip from the load-pulling rope and to hold the grip.

6. In a conveying device in combination, a load-pulling rope, a carriage, carriage-traversing means, an outhaul-rope, a grip secured to said outhaul-rope and adapted to engage the load-pulling rope, a trip and holding device adapted to both free the grip from the load-pulling rope and to hold the grip, and manually-operative means for releasing the grip from said holding device.

7. In a conveying device in combination, a load-pulling rope, a carriage, carriage-traversing means, an outhaul-rope, a grip secured to said outhaul-rope and adapted to engage the load-pulling rope, a combined grip freeing and holding device located inwardly of the extreme travel of the load and adapted to automatically free the grip from the load-pulling rope and also to engage and hold the grip, and manually-operative means for releasing the grip from said holding device.

8. In a conveying device in combination, a load-pulling rope, an outhaul-rope, a grip secured to said outhaul-rope and normally operative to engage the load-pulling rope to pull it outward, mechanism for freeing the grip from the load-pulling rope at a fixed point in its inward travel, and means for reengaging the grip upon the load-pulling rope as desired.

9. In a conveying device in combination, a load-pulling rope, an outhaul-rope, a grip secured to said outhaul-rope and embracing the load-pulling rope, and normally operative to hold the load-pulling rope against movement therethrough in one direction, means for automatically releasing the grip from the load-pulling rope when it reaches a certain point, and means for reengaging the grip upon the load-pulling rope when desired.

10. In a conveying device in combination, a load-pulling rope, a movable supporting-guide therefor, means for moving said guide, an outhaul-rope, a grip secured to said outhaul-rope and normally operative to hold the

load-pulling rope against movement there-  
through in one direction, a trip and a hold-  
ing device adapted respectively to free the  
grip from the load-pulling rope and to en-  
5 gage and hold the grip, and means for releas-  
ing the grip, when desired, to permit its en-  
gagement with the load-pulling rope.

11. In a conveying device in combination  
a load-pulling rope, a movable supporting-  
10 guide therefor, means for moving said guide,  
an outhaul-rope, a grip secured to said out-  
haul-rope and normally operative to engage  
the load-pulling rope between its guide and  
the power, a combined grip freeing and hold-  
15 ing device adapted at a fixed point to auto-  
matically free the grip from the load-pulling  
rope and to engage and hold the grip, and  
manually-operative means for releasing the  
grip from its holding device.

20 12. In a conveying device in combination  
a load-pulling rope, an outhaul-rope, a mov-  
able support for both of said ropes, means  
for moving said support, and a grip secured  
to said outhaul-rope and adapted to auto-  
25 matically grip the load-pulling rope to pre-  
vent passage of said load-pulling rope through  
it in one direction and to permit its free pas-  
sage therethrough in the other direction, sub-  
stantially as described.

30 13. In a conveying device in combination  
a load-pulling rope, an outhaul-rope, a sup-  
porting and guiding member for both of said  
ropes and means for moving said member as  
desired, a grip secured to the outhaul-rope,  
35 and adapted to automatically grip the load-  
pulling rope to prevent passage of said load-  
pulling rope through it in one direction and  
to permit its free passage therethrough in the  
other direction, and a stop adapted to engage  
40 said grip to free the load-pulling rope at a  
certain point in its inward travel.

14. In a conveying device in combination  
a load-pulling rope, an outhaul-rope, a sup-  
port and guide for both of said ropes, and  
45 means for moving said guide as desired, and  
a grip secured to said outhaul-rope adapted  
to automatically grip the load-pulling rope to  
prevent passage of said load-pulling rope  
through it in one direction and to permit its  
50 free passage therethrough in the other direc-  
tion, and a combined stop and holding device  
adapted at a fixed point to engage the grip to  
free it from the load-pulling rope and to hold  
it against return.

55 15. In a conveying device in combination  
a load-pulling rope, an outhaul-rope, a sup-  
porting-guide for both of said ropes, means  
for moving said guide as desired, a grip se-  
cured to said outhaul-rope and adapted to au-  
60 tomatically grip the load-pulling rope to pre-  
vent passage of said load-pulling rope through  
it in one direction and to permit its free pas-  
sage therethrough in the other direction, a  
combined stop and holding device adapted  
65 to engage the grip in its inward movement to  
free it from the load-pulling rope and to hold  
it against return, and a manually-operative

means for releasing the grips from said stop  
and holding device.

16. In a conveying device in combination, 70  
a load-pulling rope, an outhaul-rope, a grip  
secured to the outhaul-rope and adapted to  
engage the load-pulling rope to draw it out-  
ward, and means for pulling out the load-pull- 75  
ing rope independent of the said outhaul-  
rope.

17. In a hoisting and conveying device in  
combination a trackway, a carriage thereon,  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said carriage, a 80  
grip adapted to engage the hoisting-rope and  
movable upon the trackway, and a grip out-  
haul-rope having a guiding-support upon the  
carriage.

18. In a hoisting and conveying device in 85  
combination a trackway, a carriage thereon,  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said rope, a grip  
movable upon the trackway and adapted to  
automatically engage the load-hoisting rope 90  
to prevent its being pulled inward through  
the grip but permitting its free outward move-  
ment therethrough, and a grip outhaul-rope  
having a guiding-support upon the carriage.

19. In a hoisting and conveying device in 95  
combination a trackway, a carriage thereon,  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said carriage, a  
grip between the carriage and the inner end  
of the trackway adapted to engage the hoist- 100  
ing-rope and movable upon the trackway, and  
a grip outhaul-rope having a guiding-sup-  
port upon the carriage.

20. In a hoisting and conveying device in  
combination a trackway, a carriage thereon, 105  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said carriage, a  
grip between the carriage and the inner end  
of the trackway adapted to engage the hoist-  
ing-rope and movable upon the trackway, a 110  
grip outhaul-rope having a guiding-support  
upon the carriage, and means for independ-  
ently actuating said outhaul and hoisting  
ropes.

21. In a hoisting and conveying device in 115  
combination a trackway, a carriage thereon,  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said carriage, a  
grip between the carriage and the inner end  
of the trackway, movable upon the trackway 120  
and adapted to automatically engage the load-  
hoisting rope to prevent its being pulled in-  
ward through the grip but permitting its free  
outward movement therethrough, and a grip  
outhaul-rope having a guiding-support upon 125  
the carriage.

22. In a hoisting and conveying device in  
combination a trackway, a carriage thereon,  
a carriage outhaul-rope, a hoisting-rope hav-  
ing a guiding-support upon said carriage, a 130  
grip between the carriage and the inner end  
of the trackway, movable upon the trackway  
and adapted to automatically engage the  
load-hoisting rope to prevent its being pulled

inward through the grip but permitting its full outward movement therethrough, a grip outhaul-rope having a guiding-support upon the carriage, and means for independently 5 actuating said outhaul and hoisting ropes.

23. In a hoisting and conveying device in combination, a trackway, a carriage thereon, a carriage outhaul-rope, a hoisting-rope having a guiding-support upon the carriage, a 10 grip movably supported upon the trackway between the carriage and the inner end of the trackway and adapted to engage the hoisting-rope, a fixed trip for releasing the grip from the hoisting-rope, a grip-holding device, 15 means for releasing said grip-holding device, and a grip outhaul-rope having a guiding-support upon the carriage.

24. In a conveying device in combination, a support or trackway cable, a load-pulling cable, a grip having a guiding-support upon the 20 supporting-cable, a cam-dog and an abutment therefor adapted to grip the load-pulling rope between them, and a grip outhaul-rope.

25. In a conveying device in combination, 25 a supporting or trackway cable, a load-pulling cable, a grip having a guiding-support upon the supporting-cable, a cam-dog and an abutment therefor adapted to grip the load-pulling rope between them, means acting to normally 30 move the dog into gripping position, and a grip outhaul-rope.

26. In a conveying device in combination, a supporting or trackway cable, a load-pulling cable, a grip having a guiding-support upon 35 the supporting-cable, a cam-dog and an abutment therefor adapted to grip the load-pulling rope between them, a stationary stop adapted to engage the grip to release the load-pulling rope, catches thereon for retaining the grip, 40 means for releasing the catches, and a grip outhaul-rope.

27. In a conveying device in combination, a supporting or trackway cable, a load-pulling cable, a grip having a guiding-support upon 45 the supporting-cable, a cam-dog and an abutment therefor adapted to grip the load-pulling rope between them, a pulling-rope sheave at the inner end of the trackway, a stop secured to said sheave and adapted to engage the grip 50 to release the load-pulling rope, catches thereon for retaining the grip, means for releasing the catches, and a grip outhaul-rope.

28. In a conveying device in combination a load-pulling rope, a grip outhaul-rope, a movable guiding-support for both said ropes, a 55 grip adapted to engage the load-pulling rope, a yielding stop adapted to engage and release the grip from the load-pulling rope, catches swung by engagement with the grip to lock- 60 ingly engage therewith, and engaged by the yielding stop to hold them in locking position, and means for manually retracting said stop to free the grip.

29. In a conveying device in combination 65 a load-pulling rope, a guiding-sheave therefor, a grip outhaul-rope, a movable guiding-sup-

port for both said ropes, a grip adapted to engage the load-pulling rope to prevent its running back through it, a grip stop and holding device secured to said sheave and having 70 a guide for the load-pulling rope, a retractable member in said stop device adapted to engage and free the clamping member of the grip, a catch mechanism carried by said stop device and adapted to engage the grip to pre- 75 vent its return and locked in place by said retractable member, and means for retracting said member to free the grip from the catches when desired.

30. In a conveying device in combination, 80 a load-pulling rope, a grip adapted to engage the load-pulling rope to prevent its running back through it, a grip outhaul-rope, movable supporting-guides for both said ropes, a grip stop and holding device at the inward 85 end of the conveying device and having a guide for the load-pulling rope, a retractable member in said stop device adapted to engage and free the clamping member of the grip, a catch mechanism carried by said stop device 90 and adapted to engage the grip to prevent its return and locked in place by said retractable member, and a rope secured to said retractable member whereby it may be retracted to free the grip from the catches when de- 95 sired.

31. The combination with a grip adapted to be secured to a rope and having side projecting ribs or flanges, and a trip member, of a stop therefor comprising a frame having there- 100 on a retractable member adapted to engage the trip to release the grip, bell-crank levers pivoted on the frame and having one end normally lying between the retractable member and the grip and adapted under pressure of 105 the grip to swing backward and outward to clear the said retractable member, the other end of said bell-crank being thereby hooked over the rib or projection on the grip to hold it, a spring acting to normally project said re- 110 tractable member, and independent means for withdrawing said retractable member to free the grip.

32. A grip for use with cable-conveying devices comprising two side frame members, a 115 cam-dog pivoted between the frames and swung into engagement by gravity, a clamping-block between the frames and cooperating with the dog to grip the rope, and an outhaul-rope attached to the grip. 120

33. A grip for use with cable-conveying devices, comprising two side frame members, supporting-wheels on the frame, a cam-dog pivoted between the frames, a clamping-block 125 between the frames and cooperating with the dog to grip the rope, and means for attaching an outhaul-rope to the grip.

34. A grip for use with cable-conveying devices comprising two side frame members, a cam-dog pivoted between the frames and hav- 130 ing a projection adapted to contact with an object to release the grip, a clamping-block

coöperating with the dog to grip the rope, and an outhaul-rope secured to the grip.

35. A grip for use with cable-conveying devices comprising a frame, a gripping-block 5 movable by gravity to normally grip a rope to prevent its movement in one direction only, and an outhaul-rope secured to said frame.

36. In a conveying device the combination 10 with a load-pulling rope, of two independently-operative outhaul devices for said load-pulling rope.

37. In a conveying device the combination 15 with a load-pulling rope, of two independently-operative outhaul-ropes adapted to draw out the load-pulling rope, and means for operating all of said ropes from a common point.

38. In a conveying device the combination 20 with a load-pulling rope, and a movable guiding-support for said rope, of two independently-operative outhaul-ropes adapted to draw out said load-pulling rope.

39. In a conveying device the combination 25 with a carriage and means for traversing it, with a load-pulling rope having a guiding-support upon said carriage, and a limiting-stop therefor, and an outhaul-rope having a movable clamping connection with the load-

pulling rope between the carriage and the power.

40. In a conveying device the combination 30 with a load-pulling rope, an outhaul-rope therefor, and an auxiliary outhaul-rope, of a guiding connection between the main outhaul-rope and the load-pulling rope, a guiding connection between the two outhaul-ropes, and 35 a shiftable connection between the auxiliary outhaul-rope and the load-pulling rope.

41. In a conveying device the combination with a load-pulling rope and two separate outhaul-ropes, of a sliding connection between 40 one of said outhaul-ropes and the load-pulling rope, a sliding connection between the two outhaul-ropes and a controllable grip connection between the other outhaul-rope and the load-pulling rope.

THOMAS SPENCER MILLER.  
JOSEPH H. DICKINSON.

Witnesses to Miller's signature:

H. L. REYNOLDS,  
CHAS. J. RATHJEN.

Witnesses to Dickinson's signature:

EUGENE C. SMITH,  
W. B. STOVALL.