No. 878,482. PATENTED FEB. 4, 1908.

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

HOISTING AND CONVEYING DEVICE.

APPLICATION FILED JUNE 12, 1902. 2 SHEETS—SHEET 1.

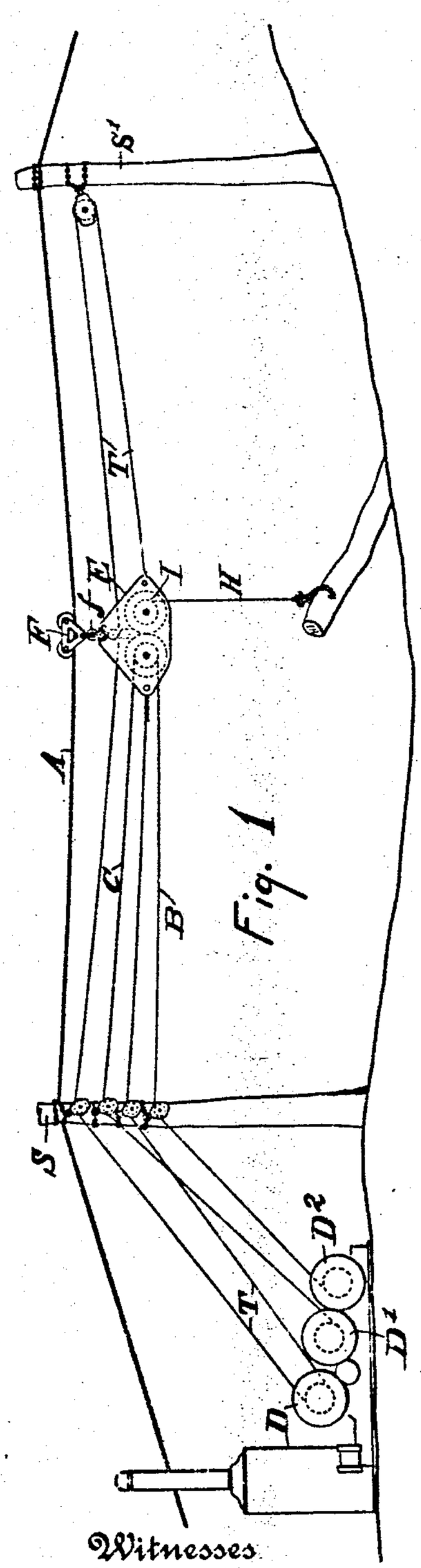

Fig. 1

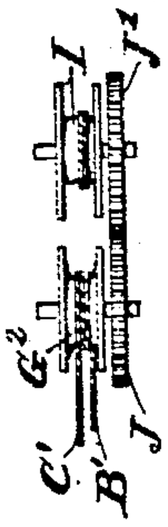

Fig. 7

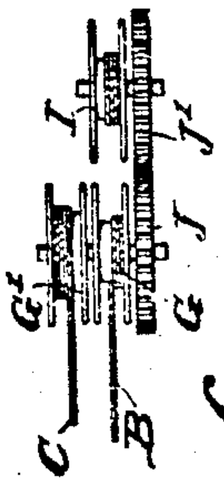

Fig. 6

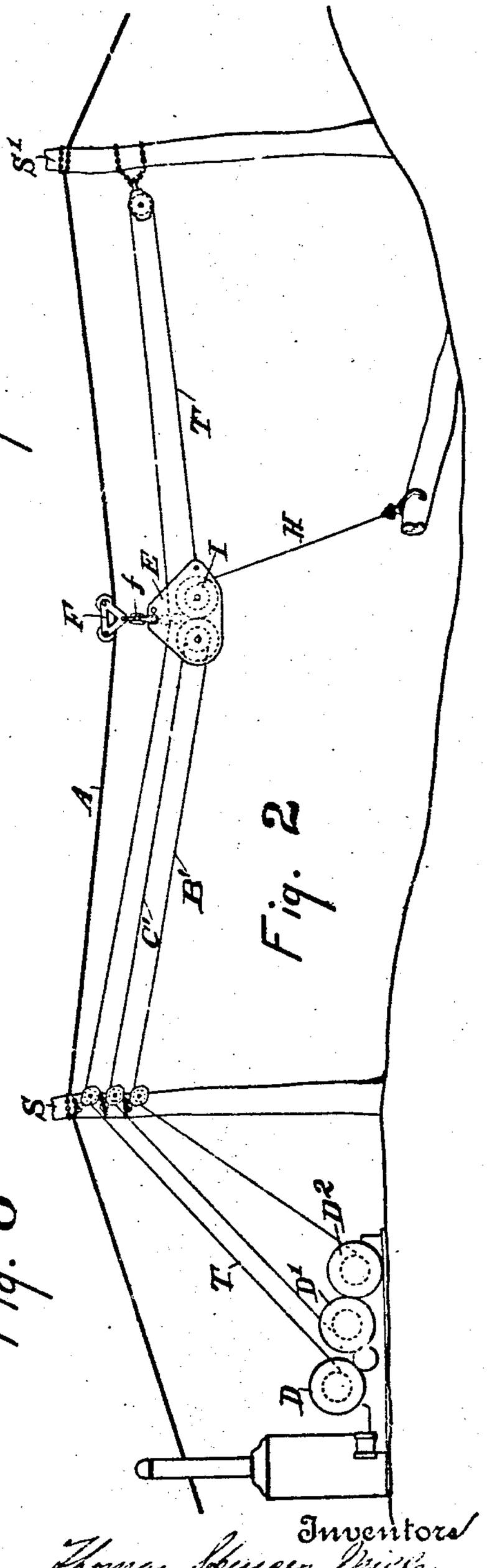

Fig. 2

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3 SHEETS—SHEET 2.

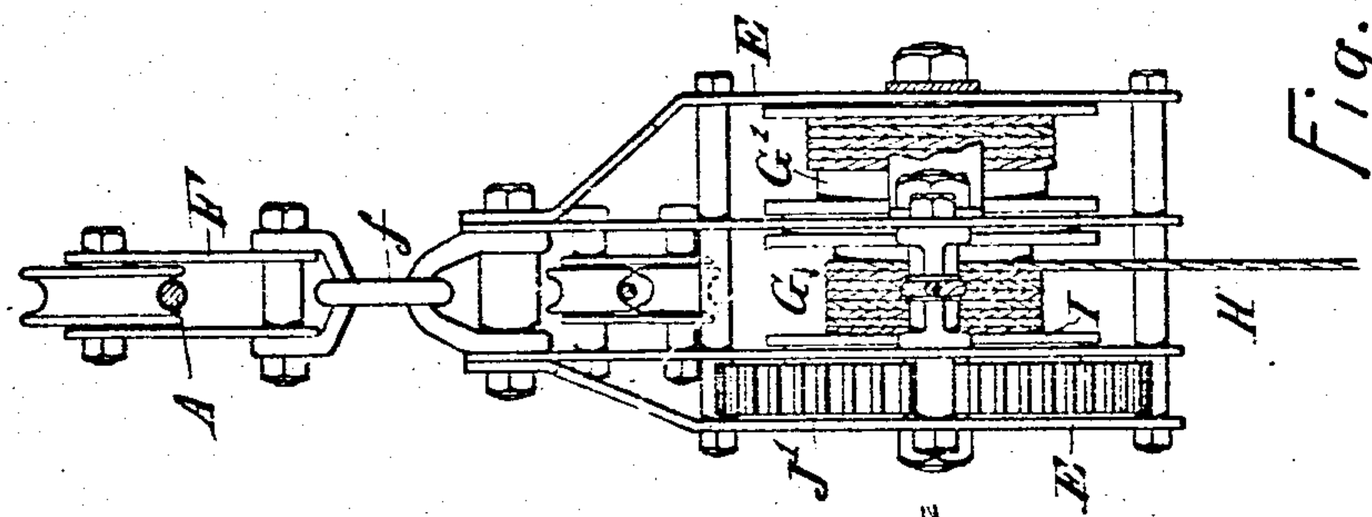

Fig. 4.

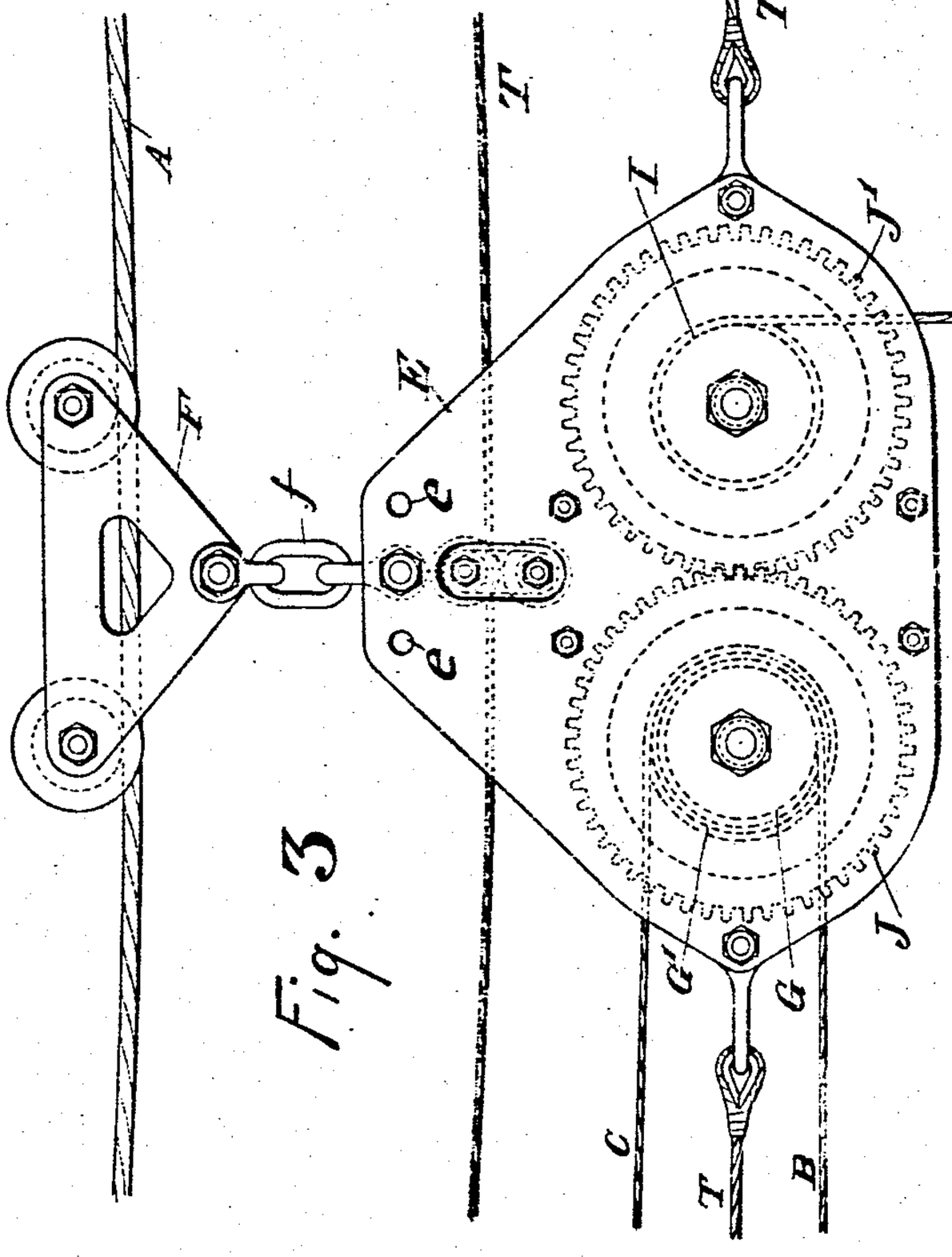

Fig. 3

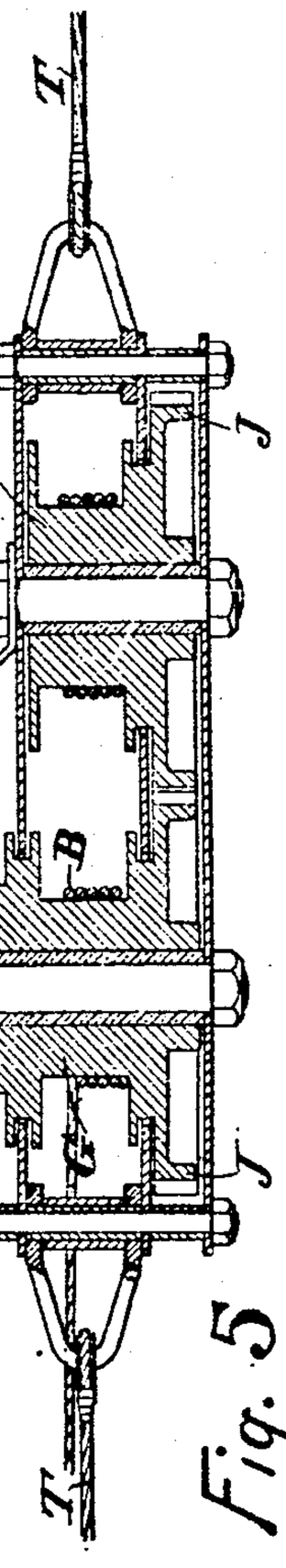

Fig. 5

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No. 878,482. PATENTED FEB. 4, 1908.

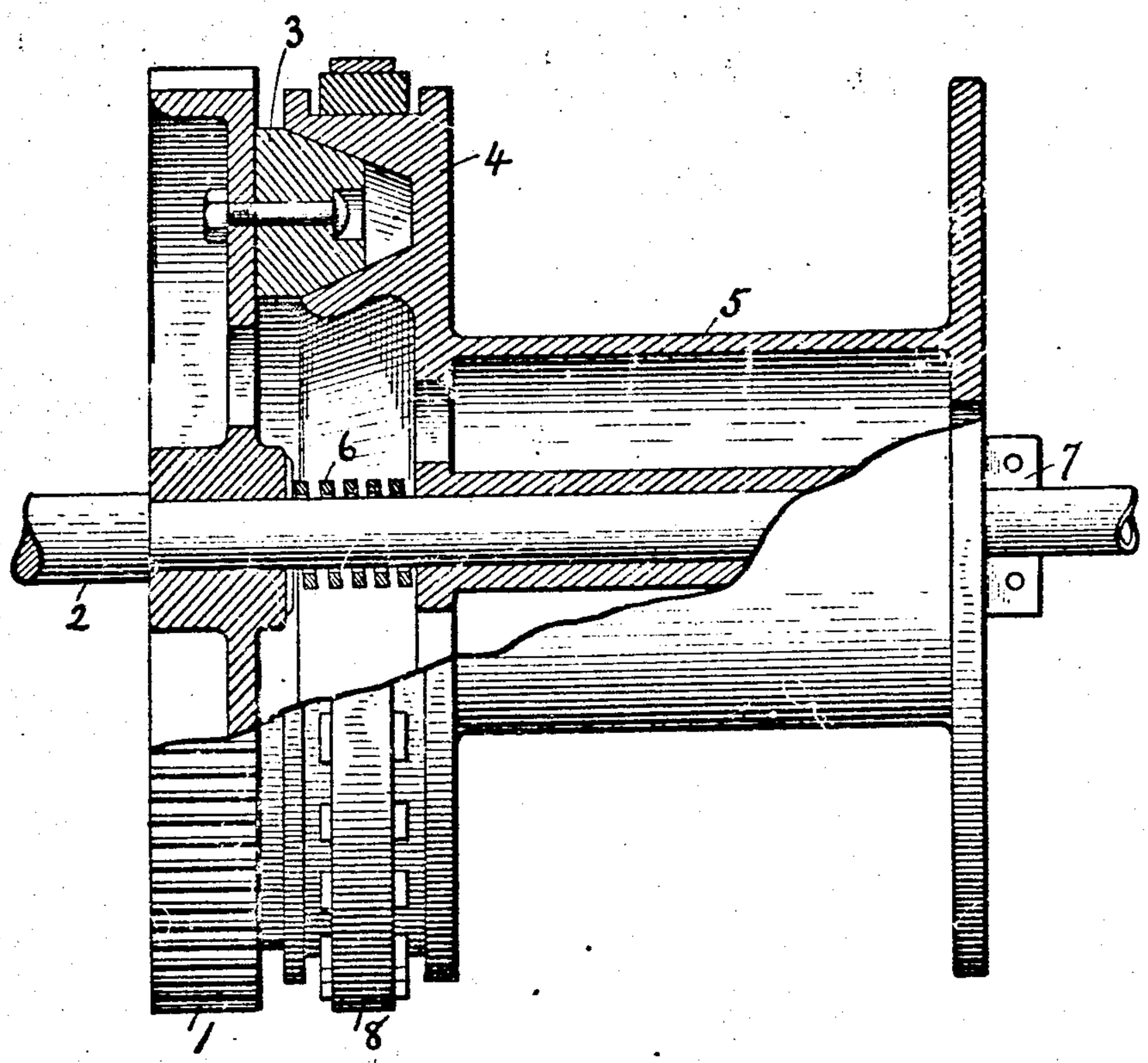
T. S. MILLER & J. H. DICKINSON.

HOISTING AND CONVEYING DEVICE.

APPLICATION FILED JUNE 12, 1902.

3 SHEETS—SHEET 3.

Fig. 8.



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UNITED STATES PATENT OFFICE.

THOMAS SPENCER MILLER, OF SOUTH ORANGE, NEW JERSEY; AND JOSEPH H. DICKINSON, OF ATLANTA, GEORGIA; SAID DICKINSON ASSIGNOR TO THE LIDGERWOOD MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

HOISTING AND CONVEYING DEVICE.

No. 878,482. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed June 12, 1902. Serial No. 111,331.

To all whom it may concern:

Be it known that we, 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, and JOSEPH H. DICKINSON, a citizen of the United States, and a resident of Atlanta, in the county of Fulton and State of Georgia, have invented a new and Improved Hoisting and Conveying Device, of which the following is a full, clear, and exact description.

Our invention relates to improvements in hoisting and conveying devices, and in the drawings accompanying herewith is shown as embodied in a cableway for collecting logs.

Our invention comprises novel parts and combinations of parts which will be hereinafter described and particularly set forth in the claims.

Figures 1 and 2 are elevations of cableways employing our invention in two slightly different forms. Fig. 3 is a side elevation, Fig. 4 an end elevation and Fig. 5 a horizontal section of the carriage, shown in Fig. 1. Fig. 6 is a plan of the operating parts of the carriage shown in Fig. 1. Fig. 7 is a plan of the operating parts of the carriage as shown in Fig. 2. Fig. 8 is a detail partly in section, showing a construction suitable for the friction hoisting-drum and the friction slack-pulling-drum.

In the operation of cableways and other hoisting and conveying devices which employ a traveling load carriage, much difficulty is experienced in causing the fall when unloaded to promptly take up the slack in the lowering or fall rope. The weight of the securing tackle on the end of the fall together with the weight of the rope end and sometimes an additional weight secured thereto, is usually relied upon to pull out the slack amount. In our present invention we have provided a slack puller or means for paying out the hoist rope so that a prompt and rapid paying out of this rope may be secured.

In both Figs. 1 and 2, S and S′ represent, respectively, head and tail supports for a cableway, A the trackway cable, H the hoist or fall rope, and T the traction or carriage hauling rope. The head and tail supports are provided with suitable guides for the various ropes. Three friction rope drums D, D′ and D² are shown driven by a suitable engine; D having the traction rope connected therewith; D′ and D² having the rope or ropes connected therewith by which the raising and lowering of the load and the fall rope is secured. Each of these friction rope-drums may be of the construction shown in Fig. 8 wherein the driven spur-wheel 1 fast upon the shaft 2 carries a V-shaped friction ring 3 entering a corresponding recess in the flange 4 of the rope-drum 5 which is loose upon the shaft 2 and is pressed toward the spur wheel 1 in opposition to the coil spring 6 by the cross key 7.

A band-brake 8 is applied to the exterior of the flange 4. When neither the band-brake nor the friction ring engages the rope drum it pays out its rope freely. When the band-brake is disengaged but the friction ring is engaged, it hauls in its rope. When the friction ring is disengaged and the band-brake is engaged, it holds its rope stationary. When the brake is lightly engaged, the paying out of the rope is under tension. When the friction ring is so lightly engaged as to slip upon the flange 4, it acts as a yielding take-up rope to instantly take in any slack that may occur in the rope which it controls. By utilizing these capabilities of the three friction rope-drums D, D′ and D², the operator at the engine is enabled to operate and control the three ropes B′, C′ and T in the manner hereinafter described without permitting any substantially undesirable slack in any of said ropes.

Upon the trackway cable is a trolley F from which is suspended a load carriage E containing the drum I, which receives the hoist or fall rope H, and the drum or drums which receive the hoist operating rope or ropes. Preferably the connection between the load carriage E and trolley F is by links *f* or other device which has a certain measure of flexibility sufficient to permit relative turning and bending between the two parts.

The carriage construction shown in Figs. 1, 3, 4, 5 and 6, comprises a suitable frame having journaled therein a drum I for the fall or hoist rope and a two part drum G and G′, the two parts of which are fixedly or

integrally connected together, and to which, respectively, are secured the ends of the runs of rope B and C by which the hoist rope is operated. The drum part G′, which receives the slack pulling run of rope C, is preferably slightly larger than the drum part G which receives the hoist-operating run of rope B, thus necessitating less power to overhaul the rope B than would be required were both drums of substantially the same diameter, thus enabling us to employ a relatively light slack pulling rope C.

We have shown the fall H as containing only a single run of rope and the drum I as consisting of only one part or barrel but we do not wish to limit ourselves in this regard, since it is evident that the runs of fall-rope may be manifolded to multiply the power of the hoist to any extent desired.

The driving connection between the drums G and I is shown as the intermeshing gear wheels J and J′ so that when one drum turns the other must also, but we do not wish to limit ourselves to this form of driving connection. The traction rope T, as shown in Fig. 1, is substantially an endless rope coupled to the carriage E.

Instead of the construction above described, that indicated in Fig. 7 may be employed. In this form the two drums G and G′ are merged into one drum G^2 which receives the loop of the single rope composed of the two runs B′, C′, which communicates its motion to the drum by its frictional grip thereon. The fall rope drum I is a storage drum of sufficient capacity to accommodate the maximum length of fall rope which will be needed. The drum G^2 preferably contains an elliptical groove with sufficient wraps of the rope therein to give the rope a sufficient grip on the wheel; though other gripping means may be substituted.

It is evident that by operating the hoist operating the runs of rope B′, C′, or B, C, the fall rope may be raised or lowered at will and the speed of lowering is independent of the weight of that part of the rope then out, or of the attachments thereto. It will therefore be possible to lower it at a greater rate of speed than where its weight alone is relied upon. The use of fall rope carriers may be also obviated with all the troubles attendant thereupon.

In moving the carriage along the trackway the hoist operating rope or ropes must be wound in or paid out to correspond with the movement of the carriage if there is to be no hoisting or lowering of the load. Two drums D′ and D^2 are therefore required to operate this rope. The frame E is supplied with different points of attachment for the suspending link *f*, as by the holes *e* so that the suspension point may be shifted as necessary to make the ropes pull right.

We are aware that the Dusedau Patent No. 566,849, dated September 1, 1896, describes two operatively connected drums mounted on the load-carriage and containing a fall-rope, a run of hoisting rope and a run of slack-pulling rope, said runs of hoisting-rope and slack-pulling rope constituting different parts of the same endless rope and extending from the load-carriage drum, respectively, in opposite directions to opposite ends of the trackway and operated by the same drum at the engine. In our construction, on the contrary, the tail ends of our slack-pulling rope C or C′ and hoisting-rope B or B′ are both at the carriage where said tail ends are connected together and with the fall-rope, preferably by a positive connection, and whence the slack-pulling and hoisting ropes extend side by side to the same end of the track-way but to different rope-drums at the engine. Said positive connection may consist of a direct connection between two of the ropes themselves as between the ropes B′ and C′ of Fig. 7, or may consist of fixing them to rigidly connected drums, as the ropes B and C are fixed to the drums G and G′ of Fig. 6; or may consist of fixing two of the ropes to drums geared together as are the drums B and I of Figs. 6 and 7. Our hoisting and slack-pulling rope runs are inversely wound on the drum or drum parts and preferably leave the drum or drum parts at points respectively below and above the same. In our construction two distinct friction-rope-drums D′ and D^2 are employed for operating the slack-pulling and hoisting ropes, respectively, so that by inhauling on both of said drums in unison the drum mechanism on the load-carriage may be held stationary as the carriage moves toward the head-support and vice versa, by paying out on the drums D′, D^2 in unison, the drum mechanism on the load-carriage may be held stationary as the load-carriage travels toward the tail-support. But when it is desired to operate the drum mechanism on the load-carriage in either direction, it may be done by hauling in on one of the drums D′ or D^2 while the slipping of the friction of the other drum permits it to pay out under sufficient tension to maintain any required tautness of said hoisting and slack-pulling ropes.

Although we prefer that the rope-drum mechanism should consist of three distinct rope-drums operatively connected together, as shown in Fig. 6, and the three ropes B, C and H should be distinct and separate ropes each connected with one of said rope-drums, nevertheless either two of said rope-drums may be merged together and either two of said ropes may be merged together; as, for example, in Fig. 7, where the rope-drums G, G′, of Fig. 6, are merged into the rope-drum or sheave G^2, and the ropes B and C of Fig. 6 are merged into the continuous rope B′, C′,

making the combination of the drum G^2 with the ropes B', C' the substantial equivalent of the drums G, G' and ropes B, C.

Although the carriage upon which the traveling drums are mounted is shown as traveling upon an elevated cable or trackway, we do not limit ourselves thereto since certain of the principles of our invention might be embodied in apparatus with the traveling drums mounted upon other forms of conveyance.

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

1. In combination, a stationary drum, a traction rope operated thereby, a traveling drum, a rope operated by said drum for connection with an object to be hauled, 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.

2. In combination, a traveling drum, a rope operated by said drum for connection with an object to be hauled, two stationary drums connected directly with said traveling drum by ropes tending to operate said traveling drum in opposite directions, a traction rope and a stationary drum for operating said rope.

3. In a hoisting and conveying device, the combination with a trackway, a carriage thereon, and means for traversing the carriage of a fall rope drum and an auxiliary drum supported from the carriage and connected to turn together, said auxiliary drum being divided into two parts of unequal diameter, a hoist rope upon the hoist drum, a hoist operating rope upon the smaller portion of said auxiliary drum, and a slack pulling rope upon the larger portion of the auxiliary drum, said two last mentioned ropes being adapted to turn the drums oppositely.

4. In a conveying apparatus, in combination, a trackway, a load-carriage, a traction rope, a drum for operating the same, three connected drum members on said carriage, a fall-rope, a hoisting-rope and a slack-pulling-rope coiled, respectively, on said drum members, substantially as described; whereby the unwinding therefrom of the hoisting-rope produces a winding of the other two ropes and vice versa; both said hoisting and slack-pulling ropes extending from the same end of the trackway to said carriage and having their tail ends at said carriage.

5. In a conveying apparatus, in combination, a trackway, a load-carriage, a traction-rope, a drum for operating the same, a drum on said carriage containing a plurality of connected parts, hoisting and slack-pulling ropes extending, respectively, from the top and bottom of said drum toward the same end of the trackway and separate power drums whereby said ropes are respectively operated.

6. 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, a traction rope, and a drum for operating said traction rope.

7. In a conveying apparatus, in combination, a trackway, a traveling carriage thereon, an outhaul traction rope having its outer free end connected to the frame of the carriage, a plurality of 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, and a rope operated by one of said traveling drum parts for connection with an object to be hauled.

8. In a conveying apparatus, in combination, a traveling carriage, an outhaul traction rope having its outer free end connected to the frame of the carriage, a plurality of drum members on said carriage, connections between said drum members, a fall rope, hoisting and slack pulling ropes coiled respectively on said drum members so that the unwinding therefrom of the hoisting rope produces the winding of the other two ropes, and vice versa, both said hoisting and slack pulling ropes extending toward the same end of the trackway from said carriage.

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

THOMAS SPENCER MILLER
JOSEPH H. DICKINSON.

Witnesses:
RICHARD W. SEABURY,
G. M. AITKEN.