

No. 864,637.

PATENTED AUG. 27, 1907.

G. A. FOX & D. DAVIDSON.
HOISTING AND CONVEYING APPARATUS.

APPLICATION FILED AUG. 9, 1906.

3 SHEETS—SHEET 2.

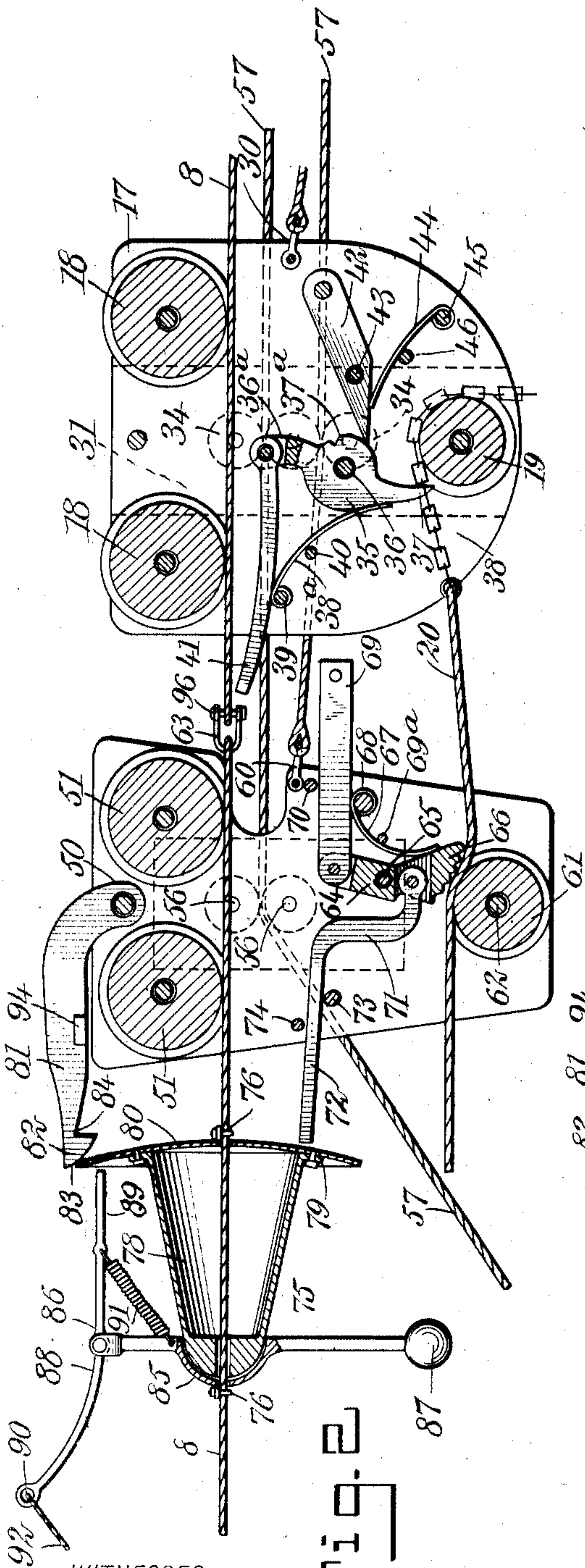


Fig. 2

WITNESSES

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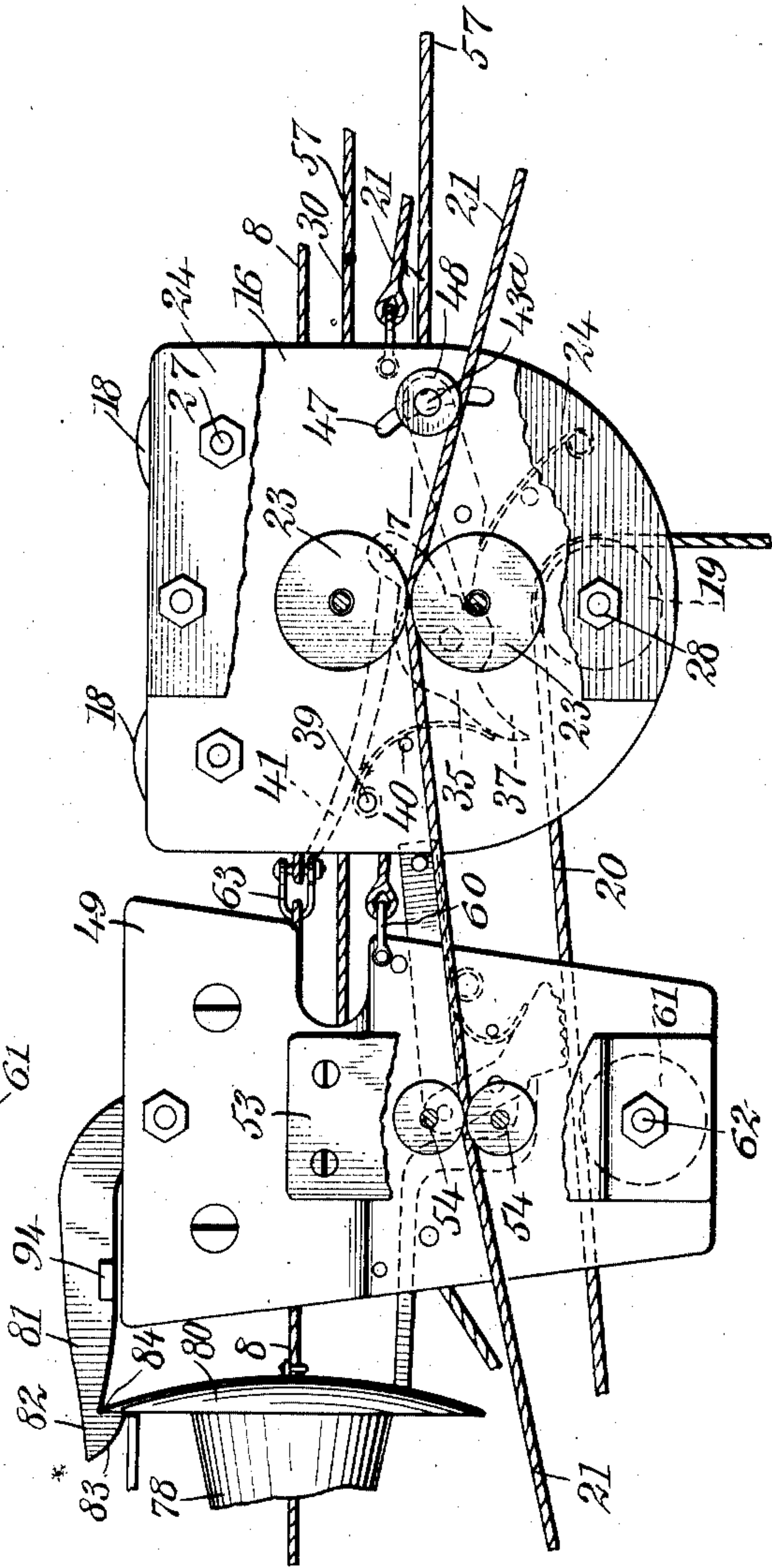


Fig. 3

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Fig. 4

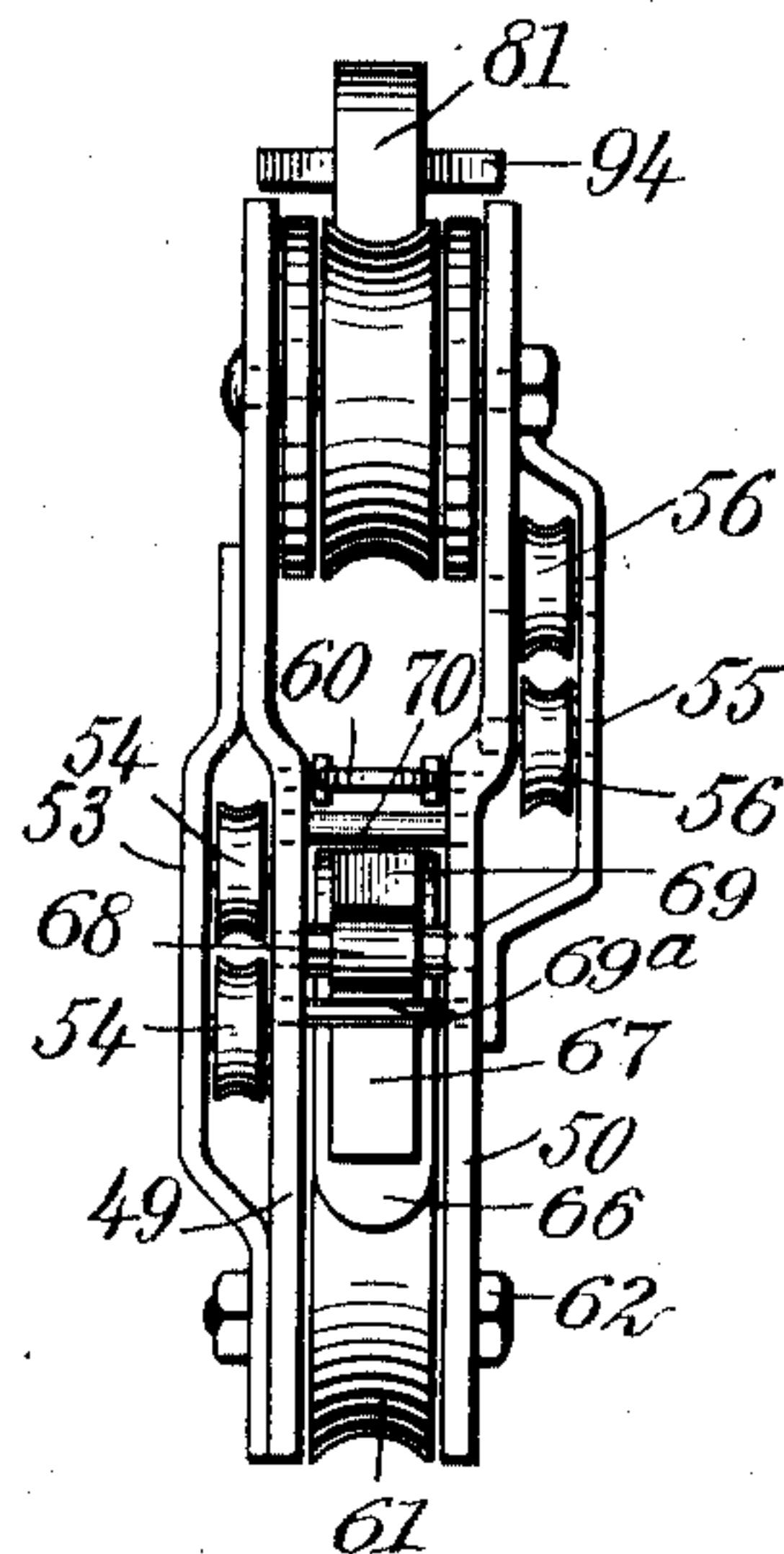


Fig. 5

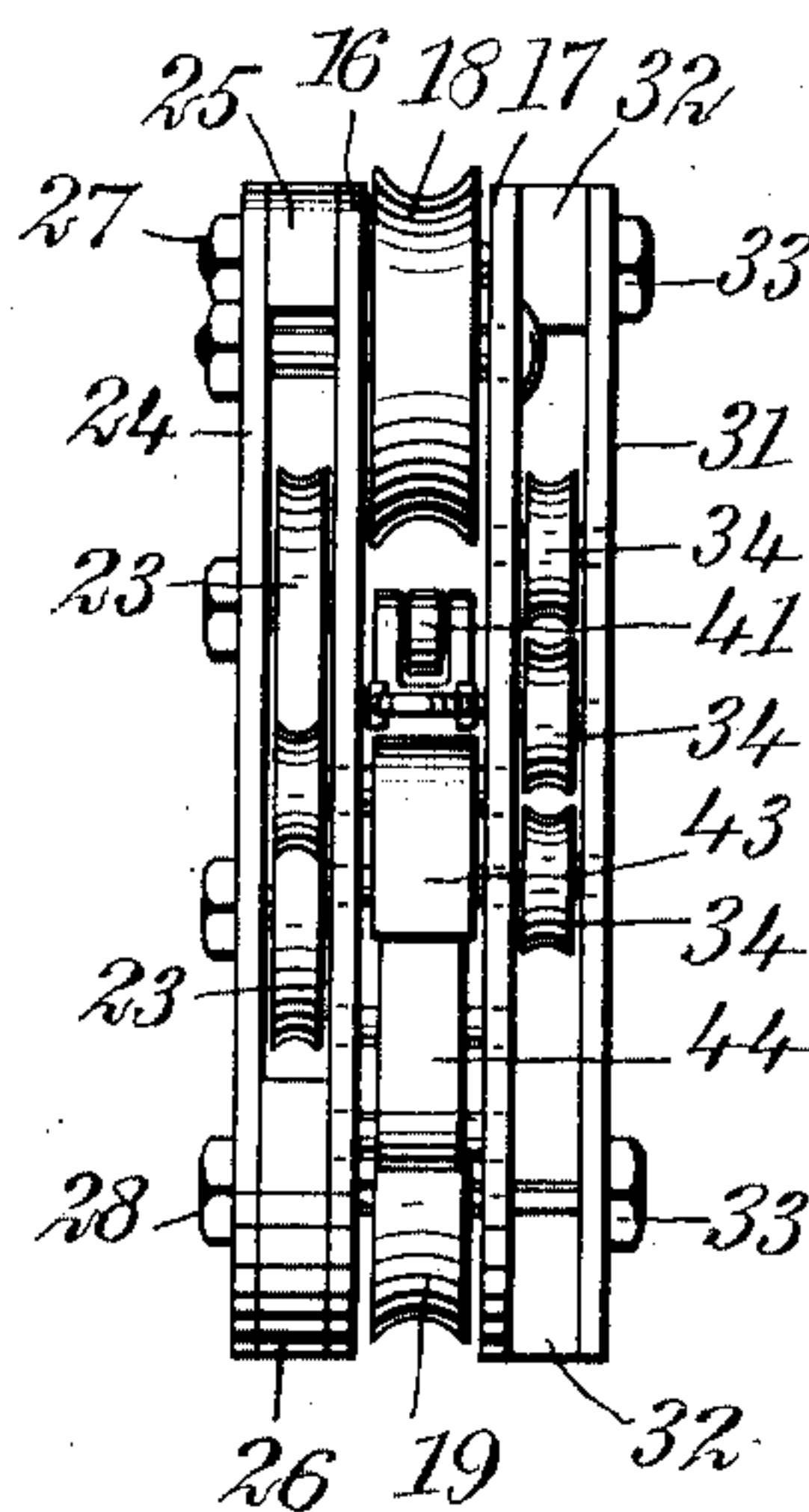


Fig. 6

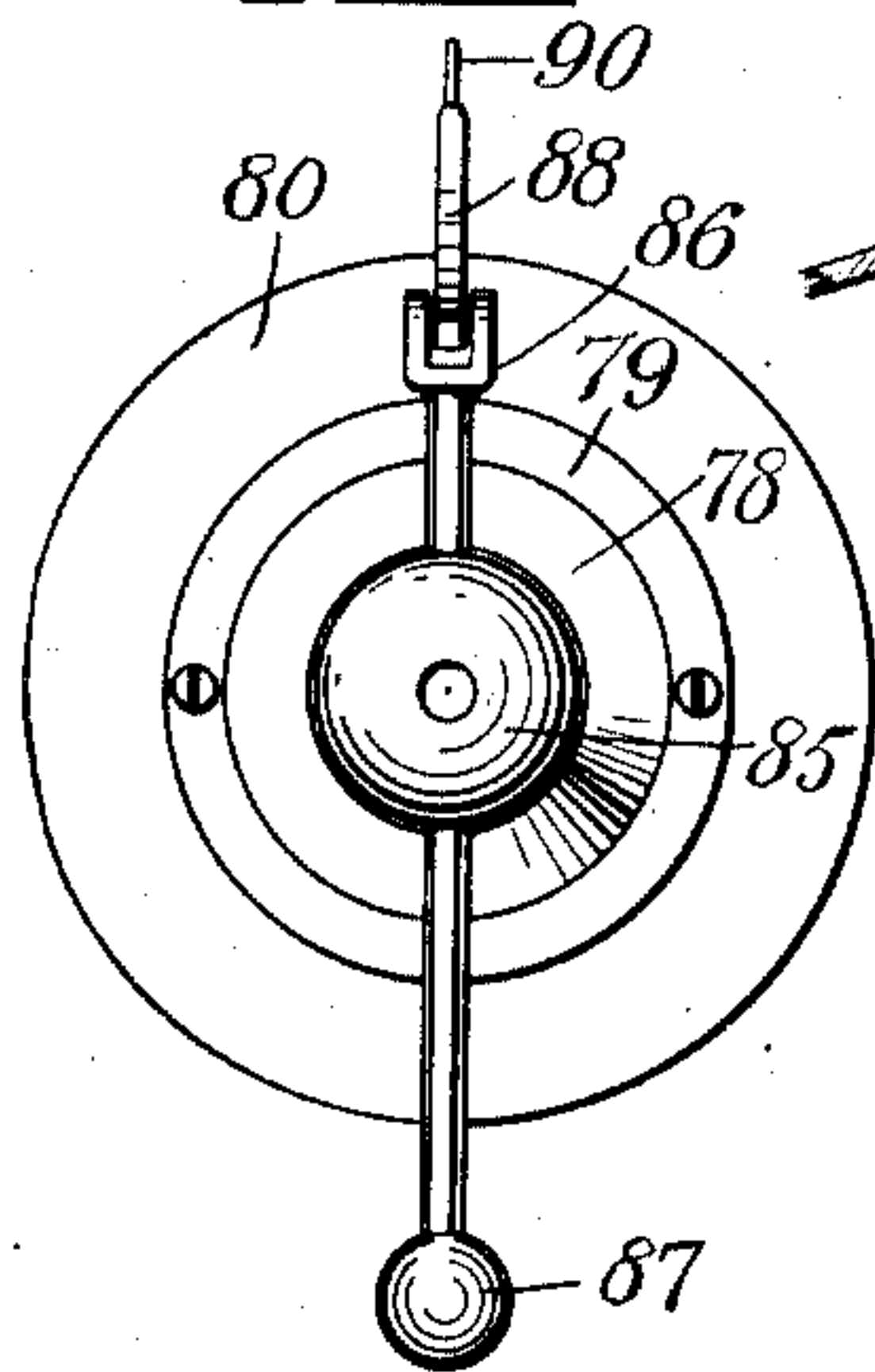


Fig. 7

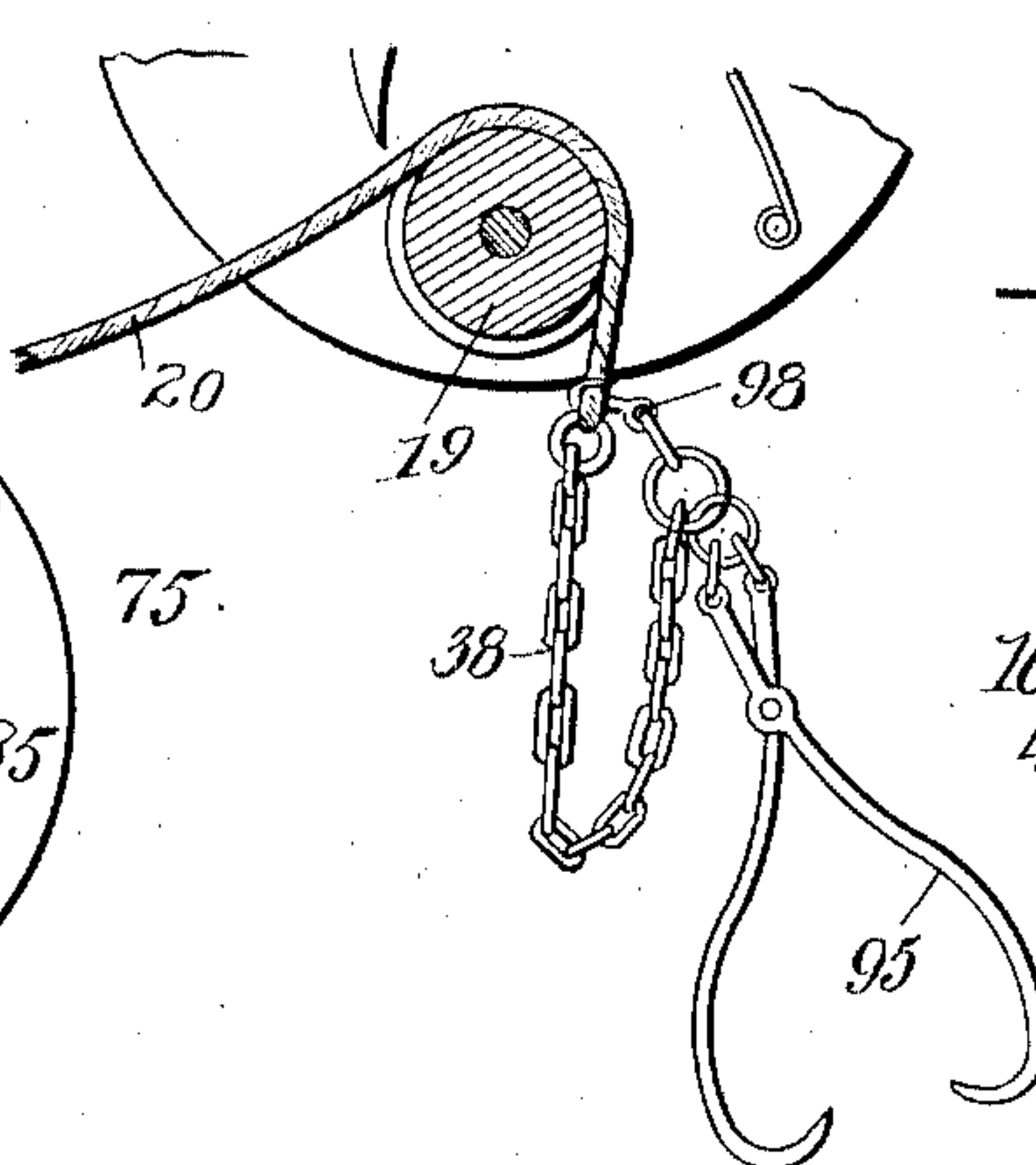


Fig. 8

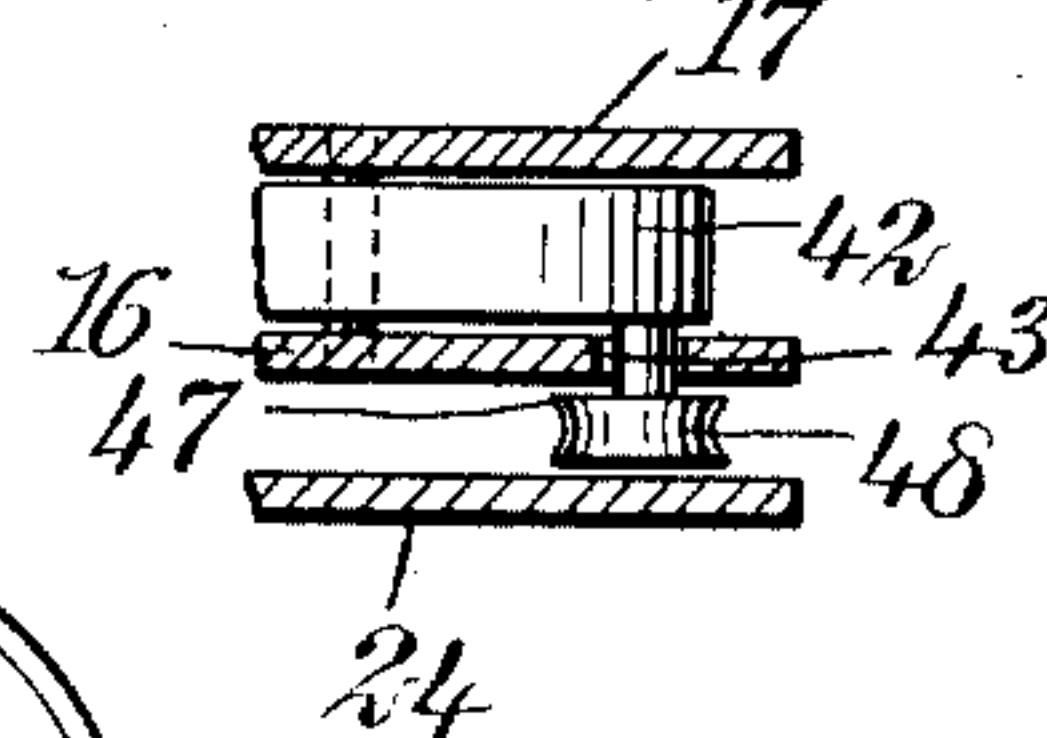
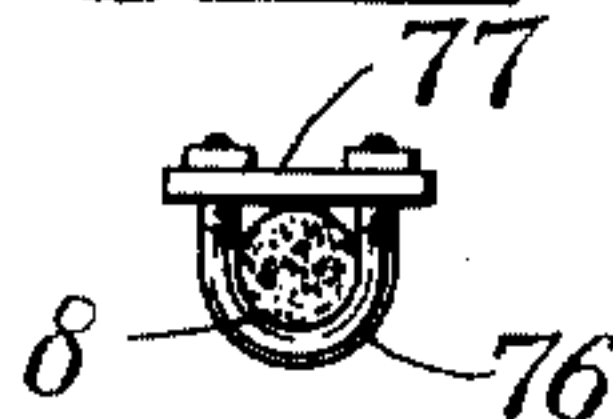


Fig. 9



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UNITED STATES PATENT OFFICE.

GEORGE ALFRED FOX AND DAVID DAVIDSON, OF TUSTIN, MICHIGAN.

HOISTING AND CONVEYING APPARATUS.

No. 864,637.

Specification of Letters Patent.

Patented Aug. 27, 1907.

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To all whom it may concern:

Be it known that we, GEORGE ALFRED FOX and DAVID DAVIDSON, both citizens of the United States, and residents of Tustin, in the county of Osceola and State of Michigan, have invented a new and Improved Hoisting and Conveying Apparatus, of which the following is a full, clear, and exact description.

This invention relates to hoisting and conveying apparatus, and is particularly useful in connection with devices of this character for use in connection with logging operations.

The object of the invention is to provide a hoisting and conveying apparatus, strong, simple and durable in construction, and by means of which heavy objects may be moved from place to place without danger of accidentally releasing the same from the holding device.

A further object of the invention is to provide a device of this class in which a slack rope carriage is used to pay out or take up the necessary slack in the fall rope required for the operation in transporting objects from place to place.

The invention consists in the construction of parts to be more fully described hereinafter and directly set forth in the claims.

Reference is had to the accompanying drawings in which

Figure 1 is a side elevation showing my invention in operation; Fig. 2 is a vertical longitudinal section of a slack rope carriage and a load carriage used in my invention, showing the same in a position just prior to releasing the load; Fig. 3 is a side elevation of the slack rope carriage and the load carriage showing parts broken away; Fig. 4 is a front elevation of the slack rope carriage; Fig. 5 is a front elevation of the load carriage; Fig. 6 is an end elevation of a detail; Fig. 7 is a cross section of a part of the load carriage on the line 7—7 of Fig. 3, Fig. 8 is an elevation of a detail and Fig. 9 is an elevation of a detail.

Before proceeding to a more detailed explanation of my apparatus, it should be understood that I employ a cable or track-way of the usual kind, supported between posts or towers, upon which are mounted two carriages adapted to run upon the same, being supported by grooved rollers. One of these carriages, the load carriage, is the one to which the load of logs or other objects is directly secured, while the other, the slack carriage, acts as an auxiliary to pay out or take up the slack, as will appear hereinafter. The carriages are moved outwardly from the head support by independent outhaul ropes and are moved toward the end support near which the driving engine is located by means of the fall rope, which acts at the same time as an inhaul rope. For the latter purpose the carriages are provided with catches, by means of which the fall rope may be secured to them, which catches may be released

under certain circumstances, as will appear hereinafter. The carriages can move independently of one another, and means are provided for holding the slack rope carriage rigid upon the cable-way at a certain point near the head support, while the load carriage is traveling towards the load and drawing with it the necessary slack which is paid out through the slack rope carriage.

Referring more particularly to the drawings, I provide a head support 1 and a tail support 1^a, which may be either upright poles of wood or properly constructed towers or of any other form. These supports are adapted to be moved from place to place as the circumstances require. In the apparatus shown in Fig. 1, I provide ordinary wooden masts or poles fixed in suitable holes in the ground. Near the head 1 is a movable engine base 2, upon which are located a steam boiler 3 and driving engine of the usual type, together with a plurality of independent drums 4, 5, 6 and 7 adapted to wind up ropes in the usual manner in hoisting engines and the like. The drums are independent and are provided with the proper clutch mechanism and gearing, by which they may be independently operated or released from connection with the engine. Mounted between the supports is a cable or track-way 8 of wire rope or other suitable material. The supports are properly guyed by means of guy ropes 9 and 10, according to ordinary practice. A sheave 11 is mounted near the upper end of the head support and through this runs a rope 12 carrying a pair of lifting tongs 13 at its free end, which is passed through a sheave 14 slidably mounted by means of a grooved wheel 15 upon a guy rope 9. It will be understood that in logging operations the trees are cut down within a certain area and my apparatus is set up to span this area, the object of the device being to carry the logs from various points to a point near the head support, where they may be loaded upon cars, wagons or the like. Thus as the loads carried by the traveling carriage are deposited near the head support they are picked up by means of the tongs 13 and deposited upon the vehicles for transportation.

The load carriage comprises side plates 16 and 17, between which near the upper edges thereof are mounted grooved wheels 18 which are adapted to roll upon the cable-way and support the carriage. Between the side plates and near the lower end of the carriage is a grooved wheel 19 over which the fall rope 20 passes, as shown most clearly in Fig. 2. An outhaul rope 21 passes from the drum 6 to which it is secured through a sheave 22, through the slack rope carriage and between a pair of grooved wheels 23 mounted between the side plate 16 and a plate 24 separated from the side plate 16 by blocks 25 and 26 and secured thereto by means of bolts 27 and 28. After passing between the grooved wheels 23 the out-

haul rope returns through a sheave 29 secured to the tail support, and is fastened to the load carriage by means of an eye 30. It will be understood that when the drum 6 is rotated by the engine, the outhaul rope 5 will be wound up drawing the load carriage toward the tail support. A second side plate 31 is separated from the side plate 17 by means of blocks 32 and is secured thereto by bolts 33. Between the plates 17 and 31 are rotatably mounted three grooved wheels 34 for a 10 purpose which will appear hereinafter. Pivotaly mounted between the plates 16 and 17 by means of a pin 36 is a pawl 35 having a finger 37 normally located adjacent to the wheel 19 but permitting the fall rope to pass freely over the wheel. The arrangement is 15 such that a chain 38 at the end of the fall rope and having links wider than the diameter of the same, cannot pass over the wheel 19 but engages the finger 37 as shown most clearly in Fig. 2. The pawl 35 has an arm 36^a and a notch 37^a. A spring 38^a mounted upon a 20 pin 39 between the plates and held in position by a stop 40 normally presses the pawl towards the wheel 19. A rod 41 is pivotally mounted at the end of the arm 36^a, projects between the plates of the carriage towards the head support and is held in a substantially 25 horizontal position by resting on the pin 39. By forcing the rod 41 inwardly the pawl is pivoted about the pin 36 to raise the finger 37 and to allow the chain to pass freely over the same. A latch 42 having a pointed end is pivoted between the plates upon a pin 30 43, and the pointed end is pressed against the pawl by means of a spring 44 mounted upon a pin 45 and held in position by a pin 46 between the plates. When the pawl is raised from the wheel 19 by pivoting it about the pin 36 the end of the latch 42 slips into the notch 35 37^a and holds the pawl from engagement with the wheel, as shown in dotted outline in Fig. 3.

At the end of the latch 42 is the pin 43 projecting through a curved slot 47 in the plate 16 and carrying a grooved wheel 48 at its end between the plate 16 and 40 the plate 24. Thus when the latch holds the pawl out of engagement with the wheel 19 the tightening of the outhaul rope 21, which passes between the plates 16 and 24, raises the said rope and presses the wheel 48 upwardly, thereby pivoting the latch about the pin 43 45 and releasing the pawl, to allow the same to be pressed by the spring 38 toward the wheel 19.

The slack rope carriage is formed of side plates 49 and 50, the upper portions of which are outwardly disposed to form a widened part between which are pivotally 50 mounted grooved wheels 51 adapted to roll upon the cable-way and to support the carriage thereupon. The upper part of the slack carriage is widened to permit the same to pass over a stop 63 upon the cable-way, which is located at a certain point for a purpose which 55 will appear hereinafter. An offset side plate 53 is secured to the plate 49 by means of bolts or rivets. Rotatably mounted between the plates 53 and 49 is a pair of grooved rollers 54, between which the outhaul rope 21 passes. Between an offset plate 55 and the side 60 plate 50 is mounted a second pair of grooved wheels 56. An outhaul rope 57 is secured to the drum 7, passes over a sheave 58 between the rollers 56 of the slack carriage, and the upper pair of rollers 34 of the load carriage to a sheave 59 on the tail support, after which it 65 returns through the lower pair of rollers 34 on the load

carriage and is secured to the slack carriage by means of an eye 60. When the drum 7 is rotated by the engine the rope 57 will be wound up to pull the slack carriage along the cable-way towards the tail support. Rotatably mounted upon a pivot bolt 62 near the lower 70 end of the slack carriage and between the side plates is a grooved wheel 61 over which the fall rope 20 passes from the drum 5. A member 64 is pivotally mounted upon a pin 65 between the side plates 49 and 50 of the slack carriage. The member 64 has a corrugated end 75 66 adapted to press the fall rope against the grooved wheel 61 to secure the rope to the slack carriage. A spring 67 mounted upon a pin 68 and held in position by a pin 69^a normally forces the arm 66 towards the 80 wheel 61. An arm 69 is pivoted to the opposite end of the member 64, projects from between the side plates towards the load carriage and is held in substantially horizontal position by the spring pin 68 and a pin 70 71 thereabove. A rod 71 is pivoted in a recess of the member 64 between the pin 65 and the wheel 61 and has an 85 end 72 projecting from between the plates 49 and 50 towards the head support. Guide pins 73 and 74 maintain the end 72 in a substantially horizontal position. It will be understood that if the end 72 is forced inwardly, the member 64 is released from the wheel 61 90 and the fall rope can pass freely over the same. Similarly if the rod 69 is forced inwardly the rope is released from fixed engagement with the slack carriage.

A stop 75 is secured upon the cable-way near the head support by means of U-bolts 76 and cross plates 77 95 adapted to be rigidly screwed upon the rope, as shown in Fig. 8. A U-bolt of this character is secured upon the cable-way at the rear and forward ends of the stop 75 and rigidly holds the same upon said cable-way. The stop 75 comprises a conical casting 78 having a 100 flange 79 to which is bolted a curved disk 80 having the edge projecting beyond the casting 78. The cable-way passes through an opening in the center of the disk 80 and a second opening in the end of the casting 78. A 105 catch bar 81 having a notched end 82 is pivoted between the side plates of the slack carriage at the upper end of the same. When the slack carriage is run against the stop 75 the notched end 82 slips over the edge of the disk 80 by reason of its curved lower edge 83 and there- 110 upon the notch 84 engages with the edge of the disk 80 to hold the slack carriage rigid upon the cable-way; at the same time the end 72 of the rod 71 is forced inwardly by contact with the surface of the disk and releases the 115 member 64 from contact with the fall rope, whereby the latter is free to move over the wheel 61. At the end of the stop 75 is swiveled an upright 85 having a forked upper end 86 and a weighted lower end 87. The cable way passes through a proper opening in the member 85 which is maintained in an upright position upon the 120 cable-way by reason of a weighted end 87 regardless of how the stop 75 may be accidentally turned or otherwise moved upon the cable-way. Pivotaly mounted at the upper end 86 is a lever 88 having an end 89 projecting towards the disk 80 and adapted to throw the 125 catch bar upward and free the same from engagement with the disk when the opposite end 90 of the lever 88 is depressed. A spring 91 secured to the end 89 and the upright 85 holds the lever in a normal position with the end 89 below the edge of the disk, as shown in Fig. 2. The end 90 of the lever is connected by means of a 130

cord 92 to the engine base 2, where by means of a tread 93 it may be forced downward by the foot of the engine driver to release the catch bar 81.

A cross bar 94 fastened upon the under side of the catch bar 81 rests against the upper edges of the side plates of the slack carriage to hold the catch bar in a substantially horizontal position when the same is freed from engagement with the disk 80.

Fig. 2 shows the carriages as they are approaching the head support with a load and just before the slack carriage comes into engagement with the stop 75. The load is carried by the fall rope 20, the end of which has a chain 38 provided, if so desired, with tongs 95 or other means for attaching logs or the like. Suitable means are provided near the end of the chain 38 to prevent the same from being accidentally drawn over the wheel 19 and through the load carriage. A hook 98 is secured to a chain ring near the tongs. By means of this the tongs can be hung upon the rope 20 or on the chain 38 in an inoperative position, as is indicated in Fig. 9, when the carriage is traveling to the point where a new load is to be taken up. The hook is adapted to act as a stop to prevent the end of the chain from being accidentally drawn over the wheel 19. When the fall rope is drawn through the load carriage far enough the chain 38 at the end of the fall rope comes into engagement with the pawl 35, the finger 37 holding a link of the chain; thus if the fall rope is released the weight of the load cannot draw the chain through the load carriage to drop the load upon the ground, as the weight of the load itself holds the chain in engagement with the pawl. Near the head support the slack carriage comes into contact with the stop 75 when the carriages reach a certain point after traveling with the load towards said head support. As the slack carriage comes into contact with the stop the catch bar 81 slips over the edge of the disk 80 and secures the slack carriage to the stop, as described above; at the same time the member 64 is released by the contact of the end 72 with the disk and the fall rope is free to move over the roller 61. As the slack carriage is stopped by contact with the stop the rod 41 of the load carriage comes into contact with the stop 63 which is properly located for this purpose upon the cable-way. The stop 63 is preferably formed of a U member having a cross bolt 96, as shown most clearly in Figs. 2 and 3. As the rod 41 strikes against the stop 63, the pawl is released from engagement with the chain 38, and the fall rope is free to move over the wheel 19 without being operatively engaged by the pawl. When the carriages have reached the end of their travel towards the head support and the fall rope is released from attachment to the carriages the engine is stopped, the drum 5 is released and the load is ready to fall upon the ground, where it is freed from the end of the fall rope chain.

In gathering a second load the load carriage is propelled along the cable-way toward the tail support by means of the outhaul rope 21. As soon as the outhaul rope 21 is tightened the latch 42 is released and the finger 37 returns to its normal position adjacent to, but separated from the wheel 19. As the slack carriage, however, remains in engagement with the stop 75 the fall rope is free to move through the slack carriage. The load carriage is propelled along the cable-way until sufficient slack for the purpose has been drawn through the slack carriage, when the same is released from the

stop 75 by means of the lever 86 actuated by the rope 92 and the tread 93. As the slack carriage is released from the stop, the fall rope is again secured to the slack carriage by means of the member 64, and is thus drawn forward with the load carriage by means of the fall rope. When the load carriage reaches the place where the load is to be collected it is stopped and held in position by means of the outhaul rope 21. The slack carriage is then drawn up to the load carriage by means of the outhaul rope 57, the slack of the fall rope being drawn through the load carriage and secured to the logs or other load, the finger 37 permitting the fall rope to pass over the wheel 19. When the load is secured by the tongs at the end of the fall rope chain the fall rope is hauled in through the carriages until the load swings clear of the ground and the chain engages with the pawl; thereupon the fall rope is used as an in-haul rope to draw the slack carriage and the load carriage along a cable-way. The chain 38 is provided with a ring to insure that the chain shall not be inadvertently drawn through the load carriage if the weight of the load is not sufficient to prevent this.

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

1. In a device of the class described, a cable-way, a load carriage mounted to run thereupon, a rope for propelling said carriage, a fall rope, means for securing said fall rope to said carriage, a slack carriage mounted to run upon said cable-way and having means for holding said fall rope, and means for locking said slack carriage upon said cable way.
2. In a device of the class described, a cable-way having a load carriage, and a slack carriage mounted to run thereupon, a rope for propelling said load carriage, a fall rope, means for securing the same to said load carriage, means for securing said fall rope to said slack carriage, means for releasing said fall rope from said carriages, and a rope for propelling said slack carriage.
3. In a device of the class described, a cable-way having a load carriage and a slack carriage mounted thereupon, ropes to propel said carriages upon said cable-way, a fall rope, means to secure said fall rope to each of said carriages, means for releasing said fall rope when said carriages reach certain points upon said cable-way, and means for releasing said fall rope from said slack carriage when the said carriages come into mutual contact.
4. In a device of the class described, a cable-way, having a load carriage and a slack carriage mounted to roll thereupon, ropes to propel said carriages upon said cable-way, a fall rope, means to secure said fall rope to each of said carriages, means for releasing said fall rope when said carriages reach certain points upon said cable-way, means for locking said slack carriage upon said cable-way, and means for releasing said fall rope from said slack carriage when said carriages are in contact.
5. In a device of the class described having a cable-way, a load carriage and a slack carriage mounted to roll thereupon, ropes to propel said carriages upon said cable-way, a fall rope, means to secure said fall rope to each of said carriages, means upon said cable-way for locking said slack carriage thereto, and means upon said cable-way for releasing said fall rope from said slack carriage when the same is locked upon said cable way.
6. In a device of the class described, a cable-way having a slack carriage and a load carriage mounted to roll thereupon, ropes to propel said carriages upon said cable-way, a fall rope passing through said carriages, said cable-way having a stop, said slack carriage having means to hold said fall rope when free to roll upon said cable-way, and means to release said fall rope when in engagement with said stop or in contact with said load carriage.
7. In a device of the class described, a cable-way, a slack carriage and a load carriage adapted to roll upon said cable-way, an outhaul rope adapted to propel said load carriage,

- a fall rope, said carriages having means for holding said fall rope, and a stop on said cable-way to release said fall rope from said load carriage, said means for holding said fall rope on said load carriage being actuated by said out-
- 5 haul rope.
8. In a device of the class described, a cable-way, a slack carriage and a load carriage mounted to roll upon said cable-way, ropes adapted to propel said carriages in one direction, a fall rope, means for securing said fall rope
- 10 to said carriages whereby said fall rope is adapted to act as an inhaul rope in the opposite direction from said propelling rope, and stops upon said cable-way for releasing said fall rope from said carriages.
9. In a device of the class described, a cable-way, a
- 15 slack carriage and a load carriage adapted to roll upon said cable-way, ropes adapted to propel said carriages in one direction, a fall rope, means for securing said fall rope to said carriages whereby said fall rope is adapted to act as an inhaul rope in an opposite direction, a stop upon said
- 20 cable-way, means for securing said slack carriage thereto, means for releasing said fall when said slack carriage is secured to said stop, and means for releasing said slack carriage from said stop manually.
10. In a device of the class described, a cable-way hav-
- 25 ing a slack carriage mounted to roll thereupon, a stop upon said cable-way presenting a surface and an edge, a fall rope passing through said slack carriage, said slack carriage having a catch bar adapted to engage with said edge, and a member adapted to secure said fall rope to
- 30 said slack carriage, said member having an arm adapted to engage with said surface whereby said member is released from said fall rope, and a lever upon said stop adapted to disengage said catch bar therefrom.
11. In a device of the class described, a cable-way hav-
- 35 ing a slack carriage mounted to roll thereupon, said cableway having a stop presenting a surface and an edge, said slack carriage having a catch-bar adapted to engage with said edge, said stop having a lever pivotally mounted upon said cableway and having means to hold the same in
- 40 an upright position, and a spring adapted to hold said lever in a normal position, said lever being adapted to disengage said catch-bar when the end of said lever is depressed.
12. In a device of the class described, a cableway hav-
- 45 ing a slack carriage mounted to roll thereupon, said cableway having a stop presenting a surface and an edge, said slack carriage having a catch-bar adapted to engage with said edge, and an upright having a weighted arm and piv-
- 50 oted upon said cableway, said stop having a lever pivotally supported upon said upright, said weighted arm being adapted to hold said lever in an upright position, said lever having a spring adapted to hold the same in a normal position, said lever further being adapted to disengage
- 55 said catch-bar when an end of said lever is depressed.
13. In a device of the class described, a cable-way hav-
- 60 ing a slack carriage and a load carriage mounted to roll thereupon, a fall rope, said carriages having means for holding said fall rope, means upon said cable-way simultaneously for holding said slack carriage and for releas-
- ing said fall rope from said slack carriage, means for propelling said load carriage to draw said fall rope through said slack carriage, and independent means for propelling said slack carriage.
14. In a device of the class described, a cable-way hav-
- 65 ing a slack carriage and a load carriage mounted to roll thereupon, means for securing said slack carriage to said cable-way, said load carriage having a grooved wheel, a fall rope adapted to pass over said grooved wheel and having a chain, said slack carriage having means for securing said fall rope thereto, said load carriage having
- 70 a pawl adapted to engage said chain, a catch adapted to hold said pawl from engagement with said chain, and an outhaul rope adapted to propel said load carriage upon said cable-way, said outhaul rope being adapted to release said catch from said pawl.
- 75 15. In a device of the class described, a cable-way having a slack carriage and a load carriage mounted to roll thereupon and having grooved wheels, a fall rope passing through said carriages over said grooved wheels, said slack carriage having a member adapted to force said fall rope
- 80 against the grooved wheel and having an arm projecting toward said load carriage whereby said member is released from said fall rope when said carriages are in contact.
16. In a device of the class described, a cable-way hav-
- 85 ing a slack carriage and a load carriage mounted to roll thereupon and having grooved wheels, a fall rope passing over said grooved wheels and having a chain, said load carriage having a pawl adapted to engage said chain and having an arm projecting beyond said load carriage, a stop upon said cable-way adapted to engage with said arm
- 90 whereby said pawl is released from engagement with said chain, and a catch mounted within said load carriage and adapted to hold said pawl from engagement with said fall chain.
17. In a device of the class described, a cable-way hav-
- 95 ing a slack carriage mounted to roll thereupon, a stop upon said cable-way presenting an edge, a catch bar upon said carriage adapted to engage with said edge, an upright mounted upon said cable-way having a weighted end, a lever at the upper end adapted to displace said catch bar
- 100 from said edge, and a spring adapted to hold said lever in a normal position.
18. In a device of the class described, a cable-way hav-
- 105 ing a slack carriage and a load carriage mounted to roll thereupon, ropes to propel said carriages upon said cableway, a fall rope passing through the said carriages, a stop upon said cable-way, means for securing said slack carriage to said stop, said slack carriage having a member adapted to secure said fall rope to said slack carriage, said member having an arm projecting towards said stop and a second
- 110 arm projecting toward said load carriage, said arms being adapted to be forced inwardly to release said member from said fall rope, and means for releasing said slack carriage from said stop.
19. In a device of the class described, a slack carriage
- 115 and a load carriage mounted upon a cableway, said slack carriage having a grooved wheel, a fall rope adapted to pass over said grooved wheel, a pivoted member having an end adapted to jam said fall rope against said wheel, said member having a spring adapted to force the same
- 120 against said wheel, an arm projecting from said slack carriage and being adapted to be forced inwardly by contact with a stop to release said arm from engagement with said fall rope, and a second arm projecting from said carriage and adapted to be forced inwardly by contact with said
- 125 load carriage to release said member from engagement with said fall rope.
- In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.
- GEORGE ALFRED-FOX.
DAVID DAVIDSON.
- Witnesses:
ROBERT HANER,
SOLOMON HICKMAN.