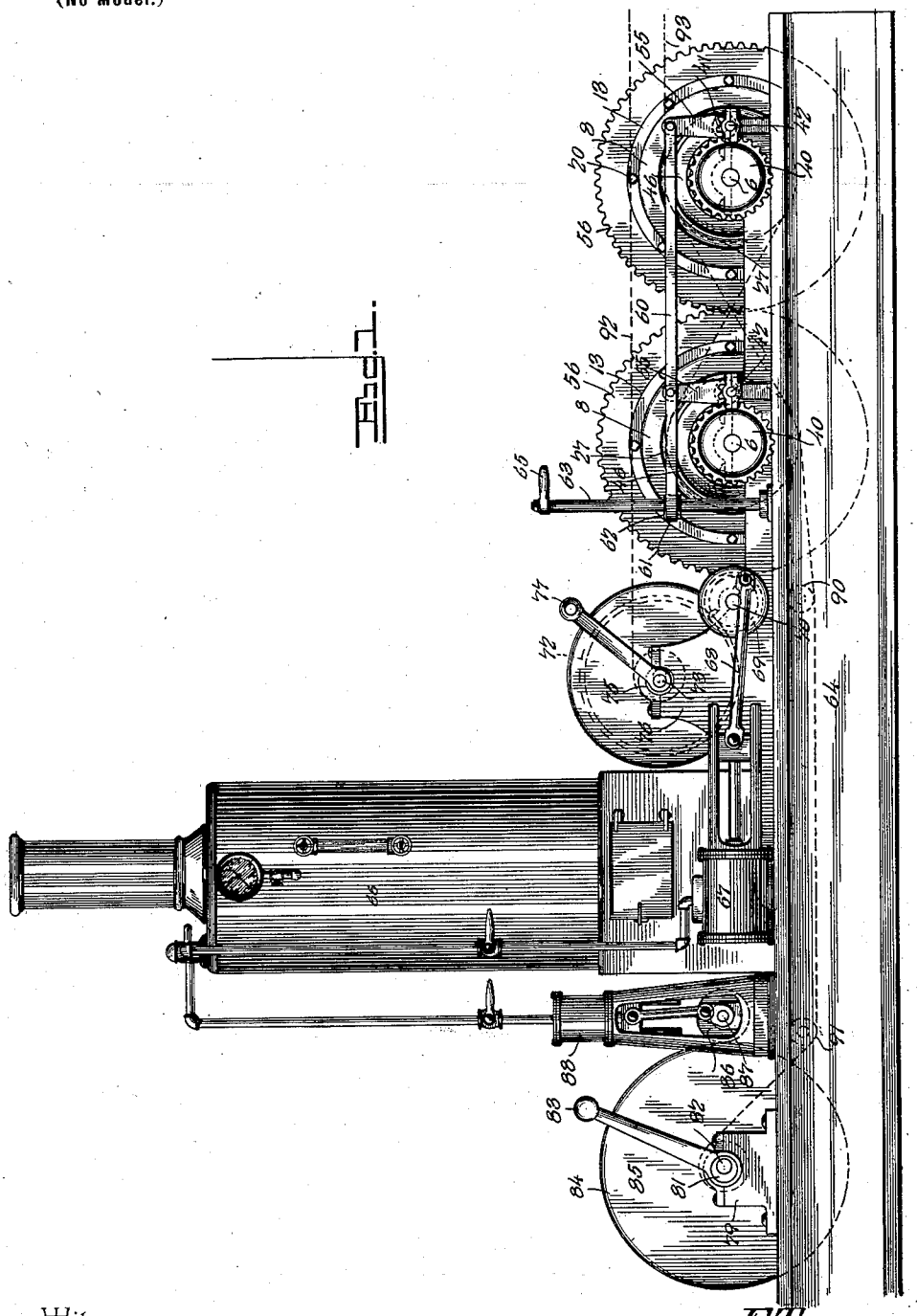
No. 650,283. Patented May 22, 1900.

E. TURNEY.

LOGGING MACHINE.

(Application filed July 18, 1899.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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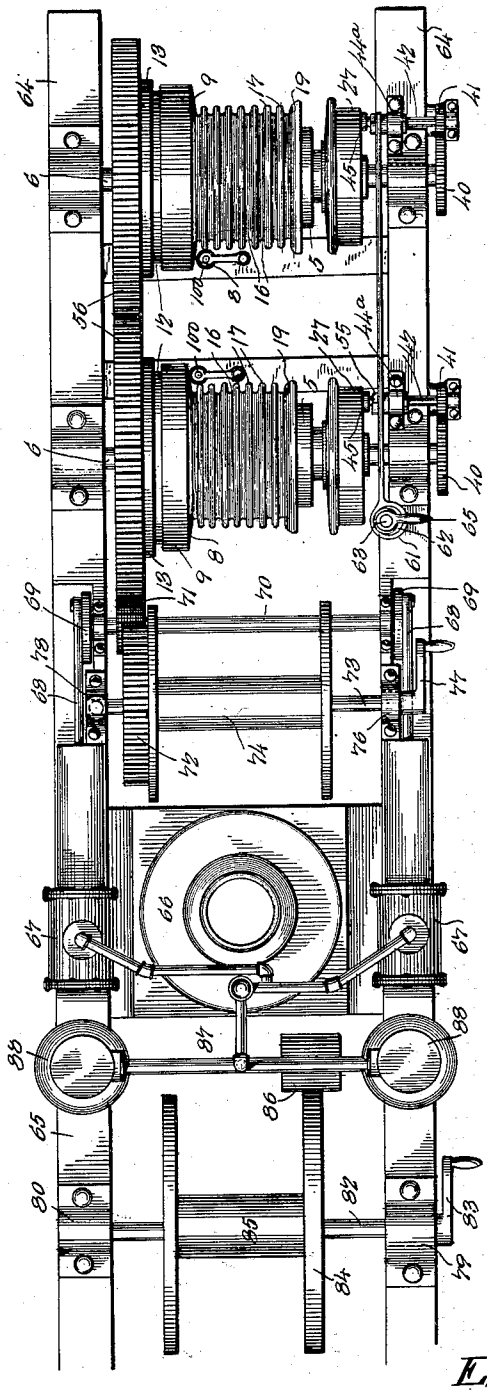
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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



Witnesses
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(No Model.) 3 Sheets—Sheet 3.

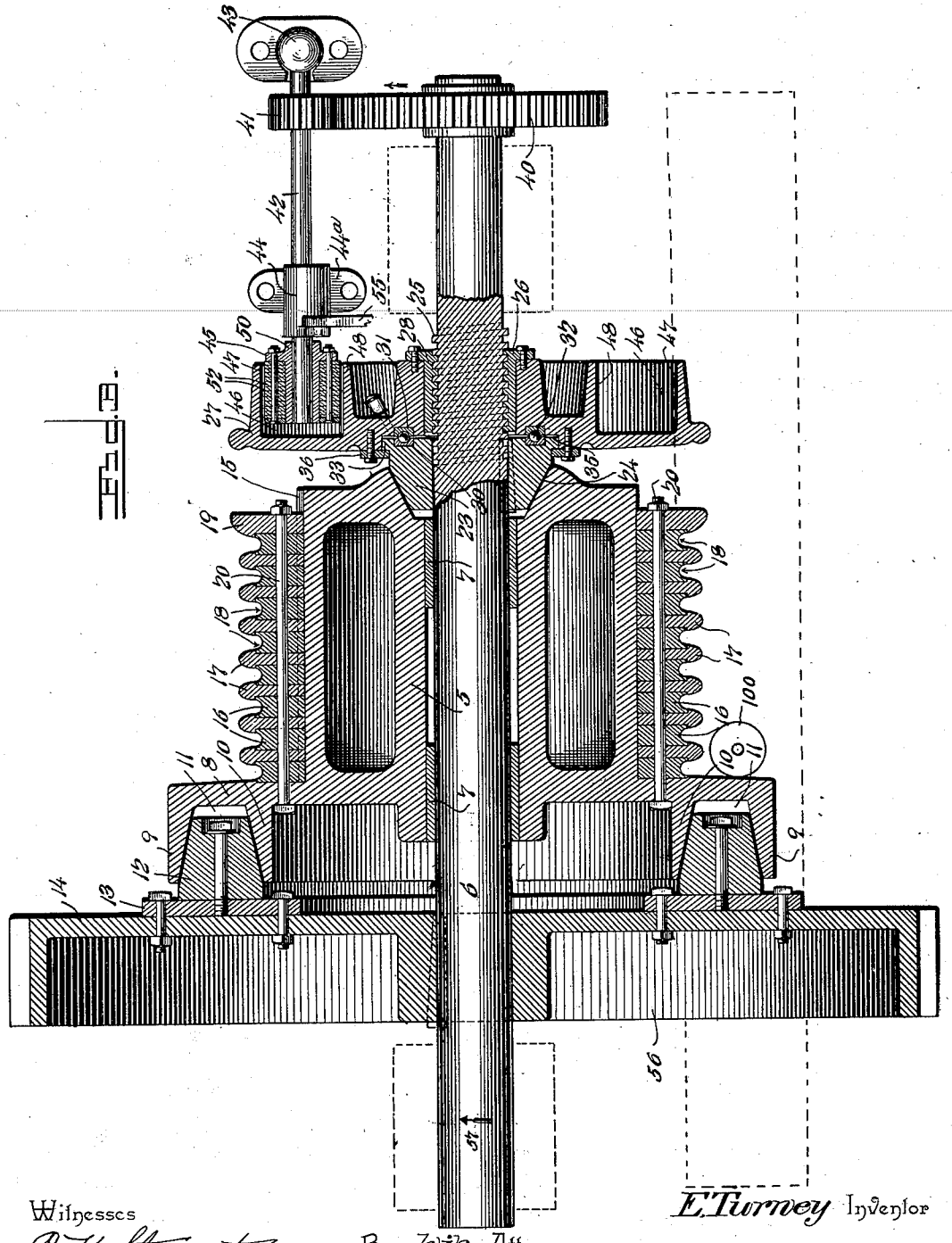


Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD TURNEY, OF PORTLAND, OREGON.

LOGGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 650,283, dated May 22, 1900.

Application filed July 18, 1899. Serial No. 724,431. (No model.)

To all whom it may concern:

Be it known that I, EDWARD TURNEY, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Logging-Machine, of which the following is a specification.

This invention relates to logging-machines, and more particularly to that portion known as the "hauling-rig;" and it has for its object, first, to provide an arrangement of the rig to adapt it for employment in connection with a single cable, in connection with which is employed a slack-drum, which drum is rotated in a manner that will cause it to take up the slack with speed and efficiency and at variable speeds corresponding to the speed of the winding-drum, its variation in speed being automatic.

An additional object of the invention is to produce a clutch mechanism which will act to effectively hold the drum upon its shaft and in which also the drum will be accurately centered at each operation to rotate concentrically with its shaft and prevent the usual wabbling motion incident to the wearing of the bushings of the drum.

Further objects of the invention will be noted from the following description.

In the drawings forming a portion of this specification, and in which similar numerals of reference designate corresponding parts in the several views, Figure 1 is a side elevation of a hauling-rig equipped with hauling-drums and arranged in accordance with this invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a horizontal central section of a hauling-drum with its clutch mechanism.

Referring now to the drawings, the winding-drum and its clutching mechanism employed in this rig consist of a drum-hub 5, which is loosely mounted upon a shaft 6 and has the usual Babbitt or other metallic bushings 7. At one end of the hub 5 is an outwardly-extending radial flange 8, which is itself provided with laterally-extending flanges 9 and 10, projecting away from and parallel with the periphery of the hub 5, and the adjacent faces of which flanges 9 and 10 are tapered inwardly to form an inwardly-tapered annular groove 11, which is adapted to receive at times a similar clutch-ring 12, mounted upon a base 13, which is in turn secured fixedly to the web 14 of a driving gear-wheel keyed or otherwise fixed to the shaft 6. The clutch-ring 12 is preferably of oak, maple, or other similar wood, and when the flanges 9 and 10 are brought to bear thereagainst the drum-hub and the parts snpported thereby are caused to rotate with the shaft 6.

The hub 5 has a plurality of longitudinal ribs 15 upon its periphery which are adapted to prevent slipping of two series of alternately-disposed rings 16 and 17, of which the rings 16 are of oak or other similar wood disposed with the grain thereof radially of the drum-hub, said rings having the inner portions of their peripheries provided with semicircular grooves 18 for the reception of the convolutions of the cable employed in connection with the drum. The rings 17, lying between the rings 16, project beyond the rings 16 and have their peripheries curved outwardly and transversely to form heads, the under edges of which lie upon the outer edges of the peripheries of the adjacent rings 16, the curvature of the heads and the grooves of the successive rings being continuous transversely. The rings 16 and 17 are so disposed that the innermost ring 16 lies against the flange 8, while the outermost ring 16 lies against the clamping-plate 19, through which and the rings 16 and 17, as also through the flange 8, is passed a series of clamping-bolts 20, through the medium of which the rings are clamped in position, said rings having keyways corresponding to the ribs 15 to receive the latter and prevent rotation of the rings with respect to the hub 5.

As above mentioned, the hub 5 is mounted loosely upon the shaft 6, and in order to move it to carry the flanges 9 and 10, forming one clutch member, into engagement with the ring 12, forming the opposite clutch member, there is splined to the shaft 6 a collar 23, the end of which adjacent the hub 5 is frusto-conical and is adapted to be moved into or out of engagement with a similar central recess 24 in the hub 5. This engagement of the collar with the hub acts to hold that end of the hub concentric with the collar 23 which is itself concentric with the shaft 6. As there is no wearing movement of the collar 23 with respect to the shaft 6, said collar will at all

times be concentric with the shaft, and hence while the engaging surfaces of the collar and the drum-hub will wear to some extent this will only act to permit the collar entering the recess 24 to a further extent and will not disturb the concentric relation of the parts. The collar 23 is adapted to be moved into and out of engagement with the drum-hub through the medium of a pulley 27, having a central longitudinal perforation provided with a bushing 26, having interior threads 28, as shown, said pulley, with its bushing, being mounted upon the shaft 6 and with the threads of the bushing in engagement with the threads 25, formed upon said shaft. Thus when the pulley 27 is rotated with respect to the shaft 6 it will move toward or away from the drum in accordance with the direction of its rotation. In order to move the collar 23 into engagement with the drum-hub, with a minimum of friction between said collar and pulley, there is formed corresponding races 30 and 31 in the collar and pulley, respectively, in the form of hard-steel rings, which have cooperating grooves in which are disposed a series of balls 32, adapted to receive direct pressure of said rings, and therethrough of the pulley and collar.

In order to draw the collar from engagement with the drum-hub, there is formed an annular outwardly-directed flange 33 at the rear edge of the collar, and which flange, with the adjacent portions of the collar, enters a corresponding recess 35 in the adjacent face of the pulley 27, and in which recess is formed an annular groove to receive the ring 31, forming a race, as above described, the opposite ring 30 lying in a corresponding annular groove in the face of the collar 23. A ring 36, encircling the collar 23 and extending inwardly beyond the outer edge of the flange 33, is screwed or otherwise secured to the face of the pulley, and as the pulley is moved away from the drum this ring engages with the collar-flange and draws the collar with it.

In order to rotate the pulley with respect to the shaft 6 in either direction to cause it to travel longitudinally thereof upon the threads 28, there is attached to the adjacent end of the shaft a gear-wheel 40, meshing with a pinion 41 upon a shaft 42, the outer end of which has a ball-and-socket journal 43. The shaft 42 has also adjacent its opposite end a bearing in a block 44, eccentrically thereof, and which block is cylindrical in form and is rotatably mounted in a bearing in the standard 44^a. The block 44 has connected therewith a lever 55, through the medium of which said block may be oscillated to move the adjacent end of the shaft 42 in an arc-shaped orbit. This bodily-movable end of the shaft 42 has fixed thereto a friction-roll 45, entering an annular groove 46 in the adjacent outer face of the pulley 27, said friction-pulley comprising a hub 50, having a flange at its outer end, against which is clamped a plurality of rings 52, mounted upon the hub 50 and forming the engaging portion of the friction-roller. The width of the groove 46 is slightly greater than the diameter of the roll 45, whereby said roll may be caused to alternately engage the outer and inner faces 47 and 48 thereof, respectively, under the influence of the lever 55.

The ends of the shaft 6 are provided with suitable bearings in supporting means for the mechanism, as shown.

The operation of this portion of the mechanism is as follows: The shaft 6 being rotated through the medium of the gear comprising the web 14 or in any other desired manner to move the clutch into operative position, as shown in Fig. 3 of the drawings, the lever 55 is operated to throw the roller 45 into engagement with the outer face 47 of the grooves 46, when the pulley 27 will be moved in the direction of the arrow shown in Fig. 3 and will travel along the shaft 6, throwing the collar 23 into engagement with the inner periphery of the recess 24 in the drum-hub, after which the drum will be moved longitudinally of the shaft 6 and the inner faces of the flanges 9 and 10 will be engaged with the adjacent faces of the ring 12, causing the drum to rotate with the gear-wheel 56, which includes the web 14, and with the shaft 6. In this operation it will be understood that the shaft 6 is moving in the direction of the arrow 57—*i. e.*, opposite to the direction of rotation of the pulley 27 under the influence of the roller 45. Conversely, when the roller 45 is thrown into engagement with the inner face 48 of the ring 46 the diameter of the roller 45 being greater than that of the pinion 41 the pulley 27 will be rotated in the same direction as the shaft 6, but with its adjacent engaging surface at a greater speed, causing the pulley to travel down the threads 25 and draw the collar 23 from engagement with the drum-hub. The ring 12 will then free itself from engagement with the drum due to the resistance of the drum to rotation of the shaft 6 and the mechanism will be in readiness for another cycle of operation.

It will be readily understood that, if desired, the shaft 6 may be rotated in any other desired manner, and it will be seen that the engaging surfaces of the drum and collar act to automatically center the drum at one end, while the clutch elements act to center at the opposite end, and that the engaging elements in their rotary motion have a self-grinding action which acts to maintain their correlative shapes. Hence, however badly worn the bore of the drum-hub becomes because of its rotation upon the shaft or because of the rotation of the shaft with respect thereto, when the drum is fixed to rotate with the shaft it will lie concentric therewith.

In the rig shown in Figs. 1 and 2 of the drawings there are employed two winding-drums with their clutch and driving mechanisms, the gears 56 thereof being in mutual

engagement, while the levers 55 have a common connecting-rod 60, having at one end an eccentric-strap 61 upon an eccentric 62, fixed to an oscillatory shaft 63, mounted in suitable bearings upon a sill 64 of the rig and provided with an operating-handle 65, through the medium of which lever-connecting mechanism the clutch mechanisms of the two drums may be simultaneously operated. The drum-shafts 6 are journaled in suitable bearings upon the sills 64 and 65 of the rig, upon which sills is also mounted a boiler 66, from which steam is supplied to the engines 67, having their pitmen 68 connected with the crank-pins or disks 69 upon a counter-shaft 70, carrying a pinion 71, meshing with one of the gears 56 and through the medium of which the drums are rotated. This pinion 71 is also adapted to be engaged at times by a gear 72 upon the shaft 73 of a drum 74, mounted in eccentric-block 75, having bearing in pillow-block 76, secured to or mounted upon the sills 64. The eccentric-block 75 has fixed thereto a crank 77, through the medium of which said block may be oscillated to move the gear 72 into and out of engagement with the pinion 71. The opposite end of the shaft 73 is journaled in a bearing 78, having a ball-and-socket support. In the rear of the boiler 66 and upon the sills 64 and 65 are secured pillow-blocks 79 and 80, in which pillow-blocks 79 is mounted an oscillatory cylindrical bearing block 81, eccentrically mounted, in which is a shaft 82, the opposite end of which is journaled in the pillow-block 80. The block 81 is provided with a crank 83, through the medium of which it may be oscillated to throw the friction-wheel 84 of a slack-drum 85, applied upon the shaft 82, into and out of engagement with a friction-wheel 86 upon the common drive-shaft 87 of engines 88, mounted upon the sills 64 and 65, and which are fed from the boiler 66. The length of the friction wheel or drum 86 is somewhat greater than the travel of the slack-drum 85 longitudinally of the shaft 82, upon which latter the slack-drum is applied. It will be noted that the base of the boiler 66 is of a square type to permit a more compact arrangement of the parts of the structure, the engine 67 being of the horizontal style and located below the fire-door of the boiler; also, that the engines 88 are of a vertical style, and that the engines 88 have separate supply-pipes from the engine 67 and also separate throttles. In practice when employing this rig with a single cable and double drum, as shown, the cable is brought inwardly and wound back and forth over the drums, as shown in Fig. 1 of the drawings in dotted lines, and is taken downwardly between the sills 64 and 65 and under guide-pulleys 90 and 91 to the drum 85. A trip-line or return-line 92 is attached to the outer end of the cable 93, and the inner end of this trip-line is secured to the drum 74, which is what is termed a "trip-drum." The line 92 is of a length sufficient to reach from its drum outwardly to the sheave or pulley, through which it is adapted to pass at the outer end of the zone of operation of the apparatus and back again to the point where the logs, hauled by the cable 93, are delivered. Thus when the cable 93 is drawn out to its full length substantially one-half the length of the line 92 will be wound upon the trip-drum and will be equal to or greater than the length of the main or hauling cable 93. With the apparatus in this position, the lever 65 is operated to clutch the winding-drums upon their shafts, and the throttles of the engines 67 and 88 are both opened, the crank 83 having been operated to engage the friction member 84 of the slack-drum with the drum 86. The winding-drums will then begin to haul upon the cable 93, and the engines 88 are given a sufficient amount of steam to maintain the cable taut between the winding-drums and the slack-drum, the throttle of the engines 88 being so set that with the maximum feed of the winding-drums the speed of the slack-drum will be sufficient to take up the slack of the cable. Thus the speed of rotation of the slack-drum will vary in accordance with the speed of the winding-drums, and this variation in speed will be automatic and will be incident to and in direct proportion with the rate of delivery of the slack. As the cable 93 is drawn in the trip-line 92 is paid out, and when the cable is drawn in to the desired extent and it is desired to pay out the cable the winding-drums are released from rotation with their shafts, and the gear 72 is moved into engagement with the adjacent gear or pinion 71, through the medium of which it will be operated to wind in the trip-line and haul the cable outwardly. It will thus be seen that instead of winding the entire length of the hauling-cable upon itself when the usual style of winding-drum is employed the maximum friction of said cable in the winding operation is against the wooden rings of the winding-drums, the winding of the slack upon the slack-drum holding the cable with such looseness and with such absence of friction as to not materially wear it, thus greatly prolonging the life of the cable and effecting a great saving in the wear and tear of the apparatus.

It will of course be understood that, when desired, a single winding-drum may be substituted for the two drums shown, in which event the rings forming the outer surface of the winding-drum will be so disposed as to produce a helical groove in the periphery of the drum to allow a helical winding of the cable thereupon. It will be furthermore understood that any desired style of engine may be employed and that the throttles of the engines, as also the cranks 83 and 77, may have operating mechanisms extending to a common point adjacent the lever 65 to enable the entire mechanism to be operated by a single attendant. In practice also the guide pulley or sheave 91 is mounted for longitudinal

movement with respect to its supporting-shaft in order to allow the slack to swing from the guide-pulley 90, so that the slack between the pulley 90 and the slack-drum 85 may lie at a sharper angle to the slack upon the drum should the longitudinal movement of the slack-drum upon the shaft be limited for any cause or from any cause. This, however, is immaterial, and the pulley 91 may be fixed against side movement, if desired.

It will be seen from the foregoing description that by the employment of a system embodying this invention the diameters of the winding-drums remain the same, so that the leverage of the drums is constant, as also is their efficiency.

In order to prevent the excessive movement of the winding-drum from the clutch-ring carried by the web 14, there is arranged a small roller 100, suitably supported upon cross-beams connecting the sills 64 and in a position to be engaged by the inner face of the flange 8 of the winding-drum, this engagement preventing the opposite end of the winding-drum engaging the collar 23 during the time that the cable is being drawn from the drum. This engagement would unnecessarily wear the collar, and there might possibly be an intermittent engagement of the drum with the collar with objectionable results, which will be appreciated. The upper ends of the spindles of the rollers 100 are braced by means of braces (shown in Fig. 2) and which are firmly secured to the cross-beams upon which the rollers are supported.

Having thus described the invention, what is claimed is—

1. In a logging-machine, the combination with a winding-drum and a slack-drum, of a cable wound upon the winding-drum and fixed to the slack-drum, and independent means for positively rotating the drums.

2. In a logging-machine, the combination with a winding-drum and a slack-drum, said winding-drum being adapted to receive a cable and pass it to the slack-drum to be wound thereon, of independent means for positively rotating said drums.

3. In a logging-machine, the combination with a winding-drum adapted to receive a cable, and a slack-drum adapted to receive the slack from the winding-drum, of independent means for positively operating said drums, and means for automatically varying the speed of the slack-drum.

4. In a logging-machine, the combination with a winding-drum adapted to receive a cable, and a slack-drum adapted to receive the slack of the cable from the winding-drum, of independent means for positively operating the drum, and means for varying the speed of the slack-drum in proportion to the speed of delivery of slack thereto.

5. In a logging-machine, the combination with a winding-drum adapted to receive a cable, and a slack-drum, adapted to receive the slack from the winding-drum, of means for driving the winding-drum, means for positively driving the slack-drum, and means for decreasing the speed of the slack-drum in proportion to the increase in diameter incident to the cable wound thereon.

6. A logging-machine, comprising a winding-drum adapted to receive the cable, a slack-drum adapted to receive the slack from the winding-drum, means for driving the winding-drum, means for positively driving the slack-drum, and means for automatically varying the speed of the slack-drum-driving means in proportion to the slack delivered.

7. In a logging-machine, the combination with a winding-drum adapted to receive a cable, and a slack-drum adapted to receive slack from the winding-drum, of means for driving the winding-drum, means for driving the slack-drum, means for throwing the slack-drum into and out of operative relation with respect to its driving means, and means controlled by the slack for varying the speed of the winding-drum in accordance with the slack delivered.

8. In a logging-machine, the combination with a winding-drum and means for driving it, said drum being adapted to receive a cable of a slack-drum adapted to receive slack from the winding-drum, separate means for driving the slack-drum simultaneously with the first-named drum, means for throwing the slack-drum into and out of operative relation with respect to its driving means, and means for varying the speed of the slack-drum in accordance with the slack delivered.

9. In a logging-machine, the combination with a winding-drum adapted to receive a cable, of a slack-drum adapted to receive the slack from the winding-drum, a boiler, an engine connected with the winding-drum and adapted to receive energy from the boiler, a throttle for said engine, a second engine adapted for connection with the slack-drum and having connections with the boiler to receive energy therefrom, and a separate throttle for the last-named engine whereby said engines may simultaneously drive their respective drums, and the speed of the slack-drum may be regulated by the delivery of slack thereto.

10. In a logging-machine, the combination with a winding-drum adapted to receive a cable, of a slack-drum adapted to receive slack from the winding-drum and to rotate simultaneously therewith, a motor for the winding-drum, an independent motor for the slack-drum positively connected therewith, a common source of energy for the motors, and independent means for regulating the supply of energy to the motors.

11. In a logging-machine, the combination with a winding-drum adapted to receive a cable, of means for driving the winding-drum, a trip-drum adapted for operative engage-

ment with said operating means, a slack-drum adapted to receive slack from the winding-drum, separate means for driving the slack-drum simultaneously with the winding-drum adapted for positive engagement therewith, means for throwing the slack-drum into and out of engagement with its driving means, and a common source of energy for the several driving means.

12. In a winding-drum the combination of a shaft having a fixed element thereon, a drum loosely mounted upon the shaft, said drum and fixed element having centering-faces adapted for mutual engagement, a second element loosely mounted on the shaft, said second element and drum having adjacent centering-faces, and a groove in the second element, a roller adapted to engage with the opposite faces of the groove to drive the element in opposite directions, and means for driving the roller.

13. In a winding-drum, the combination of a shaft having a fixed element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, a centering-block loosely mounted on the shaft, and adapted to engage and move the drum into engagement with the fixed element, a pulley in threaded engagement with the shaft and connected with the centering-block, a groove in the second element, a roller adapted to engage the opposite faces of the groove to drive the element in opposite directions, and means for driving the roller.

14. In a winding-drum, the combination of a shaft having a fixed element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, a centering-block mounted loosely on the shaft and movable into and out of engagement with the drum, a pulley in threaded engagement with the shaft and having connections with the centering-block to move it with respect to the drum, said drum being adapted to move away from the fixed element when the influence of said pulley is removed, a groove in the second element, a roller adapted to engage the opposite faces of the groove to drive the element in opposite directions, and means for driving the roller.

15. In a winding-drum, the combination of a shaft having a fixed element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, a centering-block loosely mounted on the shaft and adapted to engage the drum to move it into engagement with the fixed element, means for moving the drum from the fixed element when the influence of the centering-block is removed, a pulley having threaded engagement with the shaft and connected with the centering-block to move it longitudinally of the shaft, a groove in the second element, a roller adapted to engage the opposite faces of the groove to drive the element in opposite directions, and means for driving the roller.

16. In a winding-drum, the combination of a shaft having a fixed centering element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, a centering-block loosely mounted on the shaft and adapted to engage the drum to move it into engagement with the fixed element, means for moving the drum from the fixed element when the influence of the second element is removed, a pulley having threaded engagement with the shaft and connected with the centering-block to move it longitudinally of the shaft, a groove in the second element, a roller adapted to engage the opposite faces of the groove to drive the element in opposite directions, and means for driving the roller.

17. In a winding-drum, the combination of a shaft having a fixed element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, a second element mounted loosely on the shaft and movable into and out of engagement with the drum, a pulley in threaded engagement with the shaft and having connections with said second element to move it with respect to the drum, an annular groove in the pulley, a friction-roller adapted to alternately engage the faces of said groove, and means connected with the shaft for rotating the roller to vary the rotation of the pulley with respect to the shaft.

18. In a winding-drum, the combination of a shaft having a fixed element thereon, a drum loosely mounted on the shaft and movable into and out of engagement with the fixed element, said drum and element having centering-faces adapted for engagement, a second element loosely mounted on the shaft and adapted to engage the drum to move it into engagement with the fixed element, the engaging faces of the second element and the drum being self-centering, means for moving the drum from the fixed element when the influence of the second element is removed, a pulley having threaded engagement with the shaft and adapted to move on said threads toward and away from the fixed element, connections between said pulley and the second element to cause simultaneous movement thereof longitudinally of the shaft, an annular groove in the pulley, a roller arranged in said groove and adapted to alternately engage the faces thereof, and means for rotating said roller from the shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDWARD TURNEY.

Witnesses:
J. ROSS COLHOUN,
GEO. H. CHANDLEE.