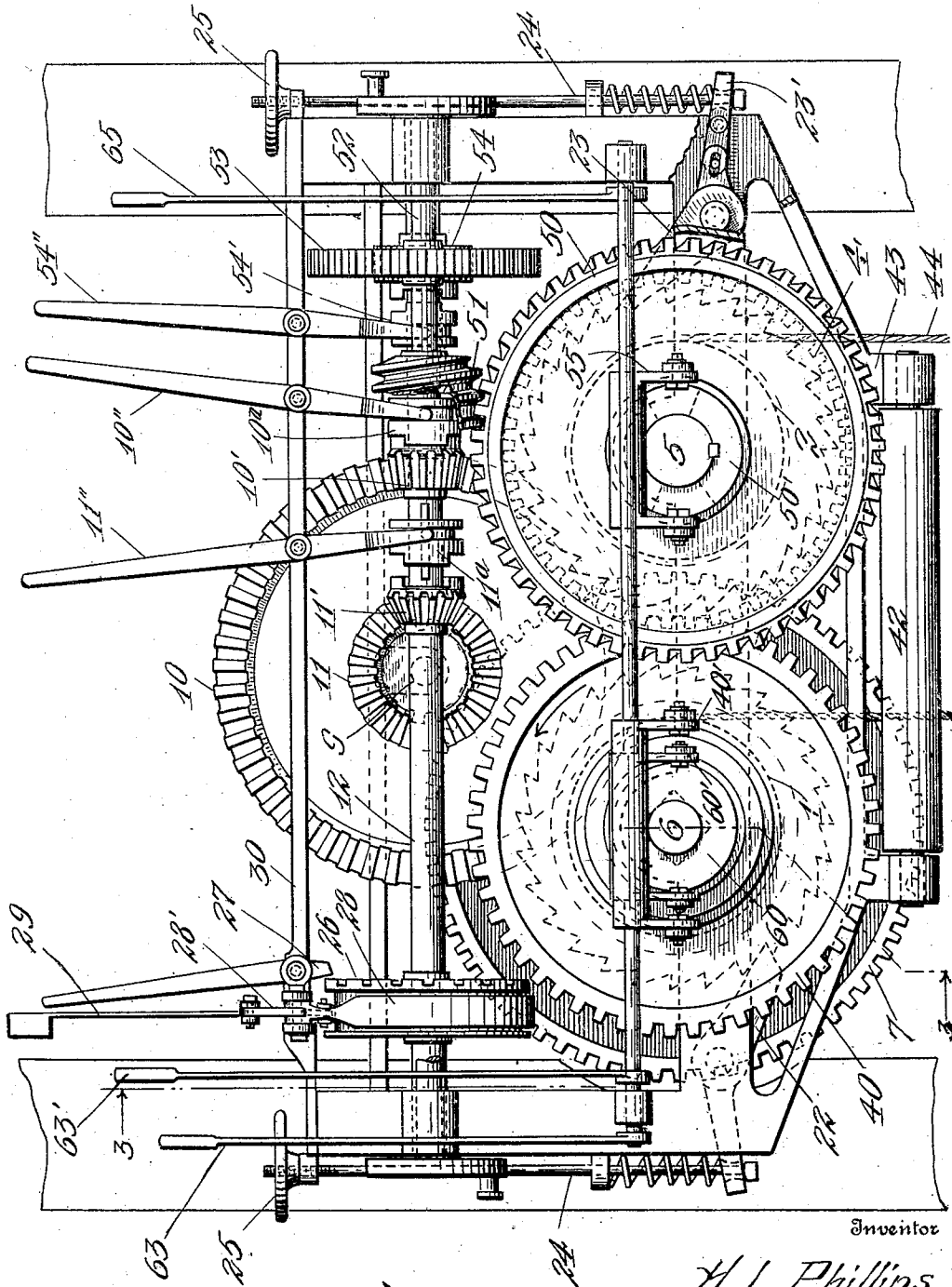


H. L. PHILLIPS.
HAULING AND HOISTING APPARATUS.
APPLICATION FILED FEB. 8, 1909.

954,881.

Patented Apr. 12, 1910.

4 SHEETS—SHEET 1.



Inventor

H. L. Phillips

Witnesses

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Arleta Adams

Fig. 1

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4 SHEETS—SHEET 2.

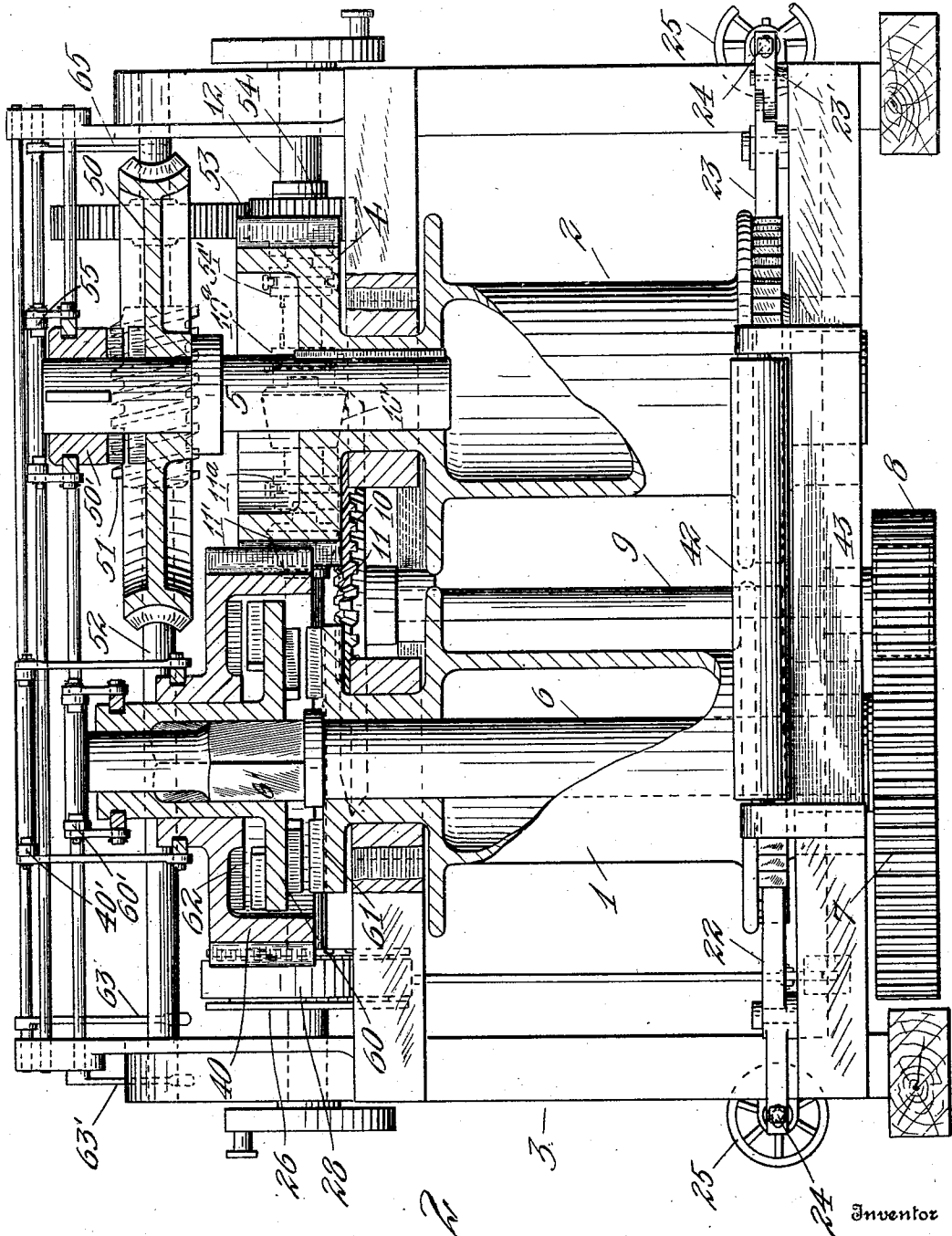


Fig. 2

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4 SHEETS—SHEET 3.

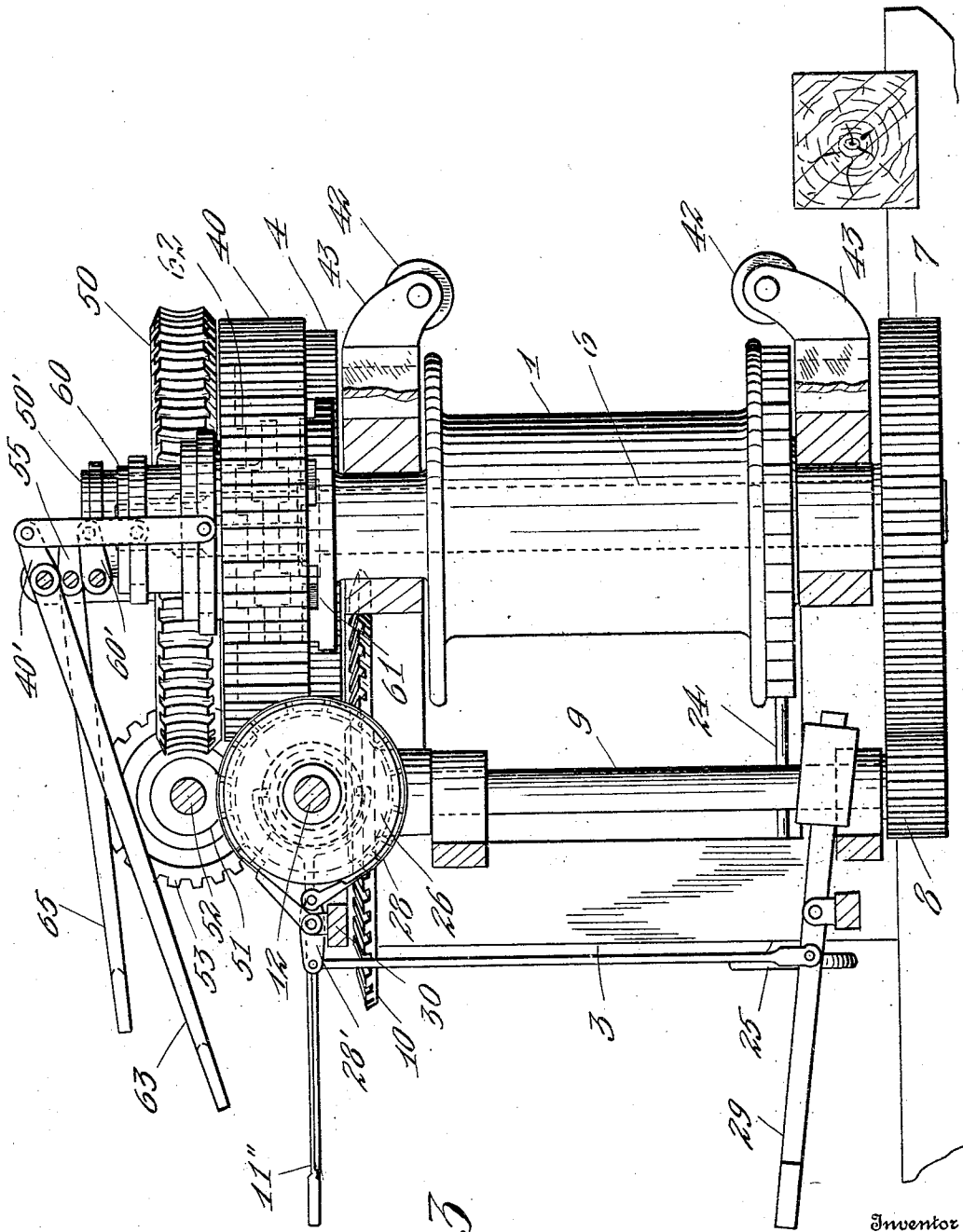


Fig. 3

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4 SHEETS—SHEET 4.

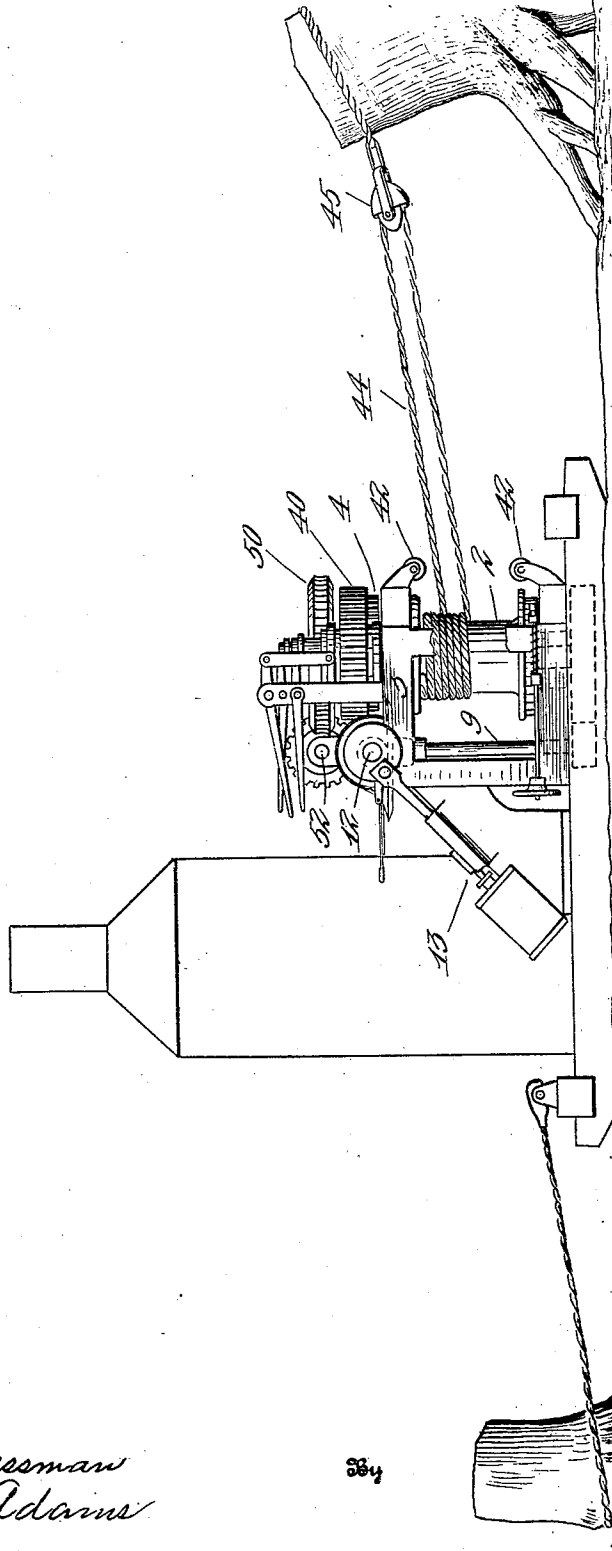


Fig. 4

Witnesses

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UNITED STATES PATENT OFFICE.

HERBERT L. PHILLIPS, OF SEATTLE, WASHINGTON.

HAULING AND HOISTING APPARATUS.

954,881.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed February 8, 1909. Serial No. 476,866.

To all whom it may concern:

Be it known that I, HERBERT L. PHILLIPS, a citizen of the United States of America, and a resident of the city of Seattle, in the
5 county of King and State of Washington, have invented certain new and useful Improvements in Hauling and Hoisting Apparatus, of which the following is a specification.

10 My invention has particular reference to variable speed mechanism for transmitting power to hauling or hoisting cables.

The primary aim of the invention is to provide a compactly arranged mechanism
15 of the above type embodying differential winding gearing, and adjustable features involving an improved application of power.

Further objects and advantages will be set forth in the following description, and those features on which I desire protection,
20 succinctly defined in the appended claims.

With reference to the accompanying drawings, wherein similar reference characters designate corresponding parts throughout: Figure 1 illustrates, in plan view, a
25 preferred form of mechanism, embodying the features of my invention. Fig. 2 is a front elevation of the same in partial section. Fig. 3 is a sectional elevation, taken
30 on line 3—3 of Fig. 1, and Fig. 4 illustrates a portable logging apparatus, embodying my invention, engaged in pulling a stump.

Referring now to the drawings, numeral
35 1 designates a drum having hub extensions journaled on a frame 3, and 2 indicates a second drum likewise mounted on said frame and secured for rotation with a spur gear 4 and a shaft 5.

40 Journaled in the hubs of drum 1, is a spindle 6 secured to a gear wheel 7, meshing with a pinion fixedly mounted on a shaft 9, journaled on frame 3 and secured for rotation with bevel gear wheels 10 and 11 of
45 unequal pitch diameters.

Meshing with wheels 10 and 11 respectively are pinions 10' and 11' loosely mounted on a drive shaft 12, which may constitute the power shaft of a reversible motor
50 or engine mechanism of suitable type, designated at 13 in Fig. 4.

Pinions 10' and 11', as shown, are provided with clutch counter-parts for engagement
55 with clutch members 10^a and 11^a respectively which are secured for rotation with shaft 12 by suitable feathers or the like,

and suitably connected with respective shifters, as 10'' and 11'', fulcrumed on a cross piece 30 of frame 3, whereby shaft 12 may be connected with either of said pin- 60 ions.

In conjunction with spindle 6 I provide releasable means for connecting the same with either drum 1 or 2 or with both of said drums, as may be desired, the said means, as
65 shown, including a double clutch member 60, slidably engaged with a squared portion 6' of spindle 6, and clutch counter-parts 61 and 62, provided respectively on the adjacent hub of drum 1 and on a spur gear 40
70 meshing with gear 4 and bored to receive the hub of member 60 freely. For adjusting the clutch, just described, I have shown rock arms 40' and 60', mounted on frame 3 in connection with handles 63 and 63' re-
75 spectively, and having link connections with respective rings loosely engaged in annular grooves provided in the hubs of gear 40 and member 60. By this arrangement member
80 60 may be adjusted, by proper manipulation of handle 63', to engage it with either counter-part, as may be desired, to connect spindle 6 with drum 1 or with gear 40 to drive drum 2, and when member 60 is en-
85 gaged with counter-part 61, gear 40 may be adjusted by manipulating handle 63 to engage counter-part 62 with said member and thereby connect the spindle with both drums. Provision is also made for operating drum
90 2 through the medium of helicoidal gearing which, as shown, comprises a worm wheel 50, loosely mounted on shaft 5, and a worm 51 meshing with said wheel and secured to a shaft 52, journaled on frame 3 and rotatable with a spur gear wheel 53,
95 meshing with a loose pinion 54 on shaft 12.

Wheel 50 and pinion 54 are each provided with suitable clutch counter-parts for engagement with adjacent clutch members, as
100 50' and 54', held for rotation with shafts 5 and 12 respectively by means of suitable feathers or the like. Member 54' is suitably connected with a shifter 54'', fulcrumed on frame part 30, and member 50' is connected, by means of a loose ring and links, with rock
105 arms 55, mounted on frame 3 in connection with a handle 65, as clearly shown.

The helicoidal gearing, just described, may be used as means for locking drum 2 from rotation in either direction by engag-
110 ing clutch member 50' with its counter-part on wheel 50, and when said member is thus

engaged, driving connection with shaft 12 may be effected by engaging clutch member 54' with its counter-part, as will be clearly understood. If it is desired to connect both of the drums with this gearing, gear 40 is connected with spindle 6 in the manner heretofore described and clutch member 50' connected with wheel 50, as above set forth.

Suitable provision should be made for restraining the drums from back action and for this purpose I have shown oppositely disposed spring pressed pawls 22 and 23, pivotally mounted on frame 3 for engagement with respective sets of ratchet teeth provided on drums 1 and 2, (see Figs. 1 and 2). These pawls are connected with respective draw rods 24, having screw threaded engagement with hand wheels 25 for adjustment to move the pawls clear of their ratchet teeth. In the case of pawl 23, the stem thereof is jointed or articulated and the outer or spring pressed portion 23' pivoted to frame 3 so that the arrangement of the adjusting mechanism just described may be the same as in the case of pawl 22.

Reference numeral 26 indicates a band wheel secured to shaft 12 and provided with a notched flange for engagement with a dog, as 27, pivoted on frame piece 30. Extending about wheel 26 is a friction band 28, connected with a rock arm 28' mounted on frame piece 30 and having link connection with a foot lever 29 for operation to apply said band to wheel 26 when it is desired to obtain a braking effect.

42 designates fair leaders for the cable, conveniently in the form of rollers mounted on respective brackets 43 of frame 3 forwardly of the end portions of the drums.

In applying the apparatus as disclosed in Fig. 4, drums 1 and 2 are connected with respective ends of the pulling cable 44, which is then engaged with a block, as 45, made fast to the stump to be pulled. Clutch member 60 is then shifted to engage it with counter-part 61, and member 11^a likewise connected with its counter-part on pinion 11'. Power is then applied to shaft 12 to rotate drum 1 in the direction indicated by the arrow in Fig. 1, to take up the slack in the cable, when clutch member 11^a is thrown out and clutch member 10^a engaged with its counter-part on pinion 10' for application of the power through gear wheel 10. Should the power as thus applied be insufficient to start the stump, it may be applied with greater effect through the medium of both drums. In this connection it should be observed that the diameters of drums 1 and 2 are preferably equal while the pitch diameters of gears 40 and 4 are unequal. Therefore, a differential pulling effect may be obtained when the drums are connected, by operating the same to play out the cable from drum 1 and take it up on drum 2. In

the present described operation, this would be effected by first shifting gear 40 to engage counter-part 62 with member 60, and adjusting pawl 22 to release drum 1 for operation in a reverse direction to that before described for take up of the cable.

The helicoidal gearing is especially useful where a nicety of adjustment is required in placing the load, as for example, when the apparatus is employed in installing structural members, or when it is essential to impart a slow uniform hauling motion to the drums. The application of the apparatus in this respect would obviously vary in accordance with existing conditions. Assuming however, that the load is first moved close to a desired position by application of the power to drum 1 through gear 10 and attendant mechanism, as hereinbefore described, further application of the power may be made through the helicoidal gearing to operate drum 2. In this event, clutch members 50' and 54' are first shifted to engage with their respective counter-parts and member 10^a shifted from engagement with its counter-part.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In an apparatus of the character described, a pair of drums, gears thereon in mesh, a drive means, one of said gears having releasable connection with its drum and with said drive means, and other gearing including a worm and worm wheel for transmitting power directly from said drive means to the other of said drums.

2. In an apparatus of the character described, a pair of drums, rotatably supported shafts therefor, one of said drums being fixed to its shaft and the other being loose on its shaft, gears on said shafts in mesh, one of said gears being loose on its shaft, means for releasably connecting said loose gear with its shaft and with said drum, a worm wheel having releasable connection with the other of said shafts, and a drive worm in mesh with said worm wheel.

3. In an apparatus of the character described, a shaft, means for driving the same, a loose drum on said shaft provided with a clutch member, a clutch member slidably engaged on said shaft for rotation therewith adapted to be moved into engagement with the clutch member of said drum, and a slidably supported gear formed with a clutch part adapted to be engaged with said clutch member.

4. In an apparatus of the character described, a shaft, means for driving the same, a loose drum on said shaft, a loose gear slidably supported on said shaft for movement toward and from said drum, said gear and said drum being formed on their opposing faces with clutch parts, and a slidable clutch

arranged on said shaft for movement therewith between said drum and said gear for engagement with the clutch parts of either or both thereof.

5 5. In an apparatus of the character described, a shaft, means for driving the same, a loose drum on said shaft, a loose gear slidably supported on said shaft for movement toward and from said drum, said gear and
10 said drum being formed on their opposing faces with clutch parts, a slidable clutch arranged on said shaft for movement there-
15 with between said drum and said gear for engagement with the clutch parts of either or both thereof, a second drum, and a gear fixed to said last named drum and being in mesh with said first named gear.

6. In an apparatus of the character described, in combination with the hauling
20 cable, a pair of drums, driving means connected with one of said drums, meshing gears thereon connecting the same for simultaneous rotation to effect an unequal feeding out and taking up of the cable on the respec-
25 tive drums, and a relatively high power transmitting gearing having releasable driving connection with the other of said drums.

7. In an apparatus of the character described, a pair of drums, rotatably supported
30 shafts therefor, gears on said shafts in mesh, means connected to one of said shafts for driving the same, the drum and gear on said last named shaft being loose and said other drum being fixed to its shaft, means for re-
35 leasably connecting said loose gear with its shaft and with both said shaft and its drum, a worm wheel having releasable connection with the other of said shafts, and a driving worm in mesh with said worm wheel.

40 8. In an apparatus of the character described, a drive shaft, a shaft connected to be driven from said drive shaft, a drum, a shaft journaled in said drum, gears on said last two shafts in mesh, a loose gear on said

last named shaft, a second drum, a gear on
45 said last named drum in mesh with said loose gear, and a clutch on said last named shaft for connecting said loose gear there-
50 with alone or both said loose gear and drum therewith.

9. In an apparatus of the character de-
scribed, a drive shaft, a driven shaft, bevel
gear wheels on said driven shaft, said bevel
55 gear wheels being of unequal pitch diameter, pinions in mesh with said bevel gear wheels
and having releasable connection with said
drive shaft, a drum, a shaft journaled in
said drum, fixed gears on said last named
shaft and said driven shaft in mesh, a loose
60 gear on said last named shaft, a second drum, a gear on said last named drum in mesh with said loose gear, and a clutch on
said last named shaft for connecting said
loose gear therewith alone or both said loose
65 gear and drum therewith.

10. In an apparatus of the character de-
scribed, a pair of drums, rotatably supported
shafts therefor, one of said drums being
fixed to its shaft and the other being loose
70 on its shaft, a drive shaft, a shaft driven from said drive shaft and having driving connection with the shaft of said loose drum,
gears on the shafts of said drums in mesh,
one of said gears being loose on its shaft,
75 means for releasably connecting said loose gear with its shaft and with said loose drum, a worm wheel having releasable connection with the shaft of the other drum, a driven shaft having releasable driving connection with said drive shaft, and a worm on said
80 last driven shaft in mesh with said worm wheel.

Signed at Seattle, Washington, this 30 day of January, 1909.

HERBERT L. PHILLIPS.

Witnesses:

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D. B. TREFETHEN.