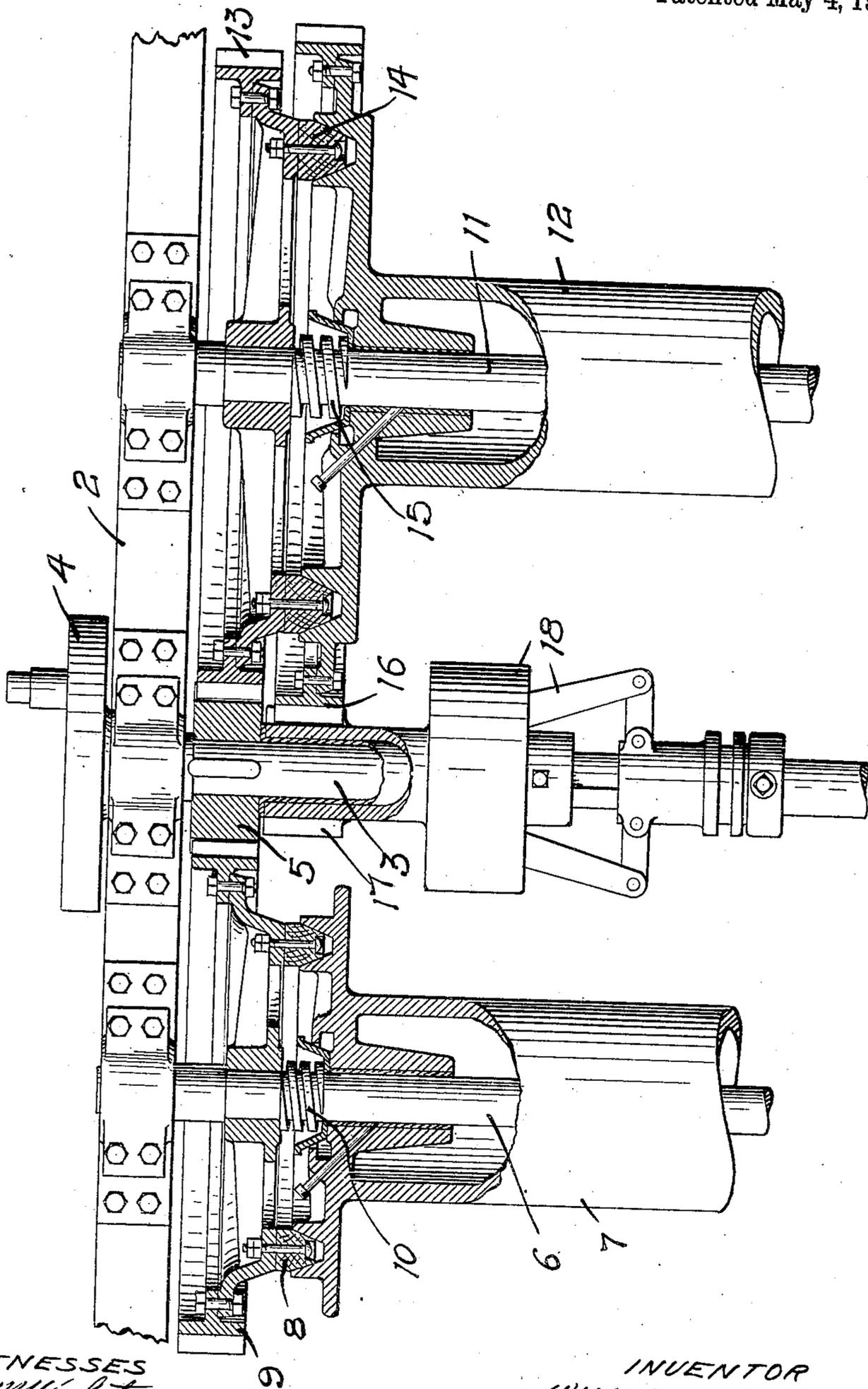


W. H. CORBETT.  
LOGGING AND HOISTING ENGINE.  
APPLICATION FILED DEC. 17, 1908.

920,436.

Patented May 4, 1909.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

WILLIAM HARRISON CORBETT, OF PORTLAND, OREGON.

LOGGING AND HOISTING ENGINE.

No. 920,436.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed December 17, 1908. Serial No. 468,051.

*To all whom it may concern:*

Be it known that I, WILLIAM HARRISON CORBETT, of Portland, Multnomah county, Oregon, have invented certain new and useful Improvements in Logging and Hoisting Engines, of which the following is a specification.

The object of my invention is to provide means whereby the main drum of the engine can be easily and quickly adapted for slow speed and great power or high speed and a light power, according to the character of the work.

The apparatus is designed particularly for handling logs and it is evident that for this work, there is great variation in the load on the engine. For instance, one log may contain five or six thousand feet of lumber and require considerable power to pull it out of the woods and the next log may be very much smaller, containing perhaps less than one thousand feet of lumber. To facilitate the work, it is desirable to handle the lighter logs quickly and consequently the engine is operated at high speed to maintain the desired capacity and the daily work of the engine. This speeding up of the engine for light work results in abnormal wear and breakage and even then, the desired speed is hardly obtained.

To obviate the objection to the ordinary method of operating a logging engine and to adapt the apparatus for heavy and light work, without materially altering the speed of the engine, is the primary cause of my invention.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawing, forming part of this specification, the figure is a view partially in section, illustrating the driving connection between the main drum the trip or return drum and the driving shaft.

In the drawing, 2 represents the frame of the machine, 3 the driving shaft having a crank disk 4 for attachment to the engine, not shown, and carrying a pinion 5 that is keyed on the shaft.

6 is a shaft, carrying a trip drum 7, which has a friction clutch connection 8 with a gear 9 that is secured to the shaft 6. The drum is normally held out of engagement with the clutch by a spring 10 and is moved lengthwise on the shaft 6 to render the clutch op-

erative by a mechanism of ordinary construction, which I have not thought necessary to illustrate herein. This drum 7 has for its purpose to return the main cable to a point where it can be attached to a log as fast as the logs are drawn in. The work of this drum is comparatively light and it is operated at a high speed, so that there may be as little delay as possible in the drawing out of the main line.

A shaft 11 is arranged parallel with the driving shaft 3 and carries the main drum 12. A gear 13 is secured on the shaft 11 and meshes with the pinion 5 and a friction clutch device 14 is provided between the gear 13 and the drum 12 and is rendered operative when the drum is moved toward the gear by a lever mechanism within the control of the operator and which being of ordinary construction, I have not thought necessary to illustrate in this case.

When the drum is forced toward the gear 13, the spring 15 is put under tension to return the drum to its inoperative position. The drum 12 is also provided with a gear rim, meshing with a pinion 17 having a running fit on the drive shaft 3 and of less diameter than the pinion 5, the gear rim being of greater diameter than the gear 13. When, therefore, the operator wishes to operate the drum 12 at a high speed as in handling small logs, he will move the drum 12 to render the clutch 14 operative and drive the drum through the pinion 5 and the gear 13. If on the other hand, in handling large, heavy logs, the operator wishes to move the drum at a slow speed and with great power, he will actuate the friction clutch mechanism 18 which is keyed on the driving shaft to drive the pinion 17 and the gear rim 16. I am thus able to obtain a two speed movement of the drum, with the desired increase in speed and loss of power or increase in power with a corresponding decrease in speed.

From the foregoing description, it will be noted that the pinion 5, keyed on the drive shaft, operates continuously and drives the two gears meshing with it with a constant ratio. This pinion is however, made larger than usual and I am able to obtain the desired high speed for the main drum and also unusually high speed for the trip drum, which is utilized for hauling out the main line. The small diameter pinion 17 meshing with the gear rim enables me to give the main

drum its high power and low speed characteristic—suitable for handling very heavy logs. It is also to be noted that this arrangement of gearing, while allowing the  
 5 desired speed ratio to be obtained, also throws the heavy work upon the friction surfaces of the clutch devices, which are of considerably greater diameter than the pinions. This is an improvement over the ordinary  
 10 apparatus where the friction being carried by the gear is necessarily of less diameter than the pitch line of the gear.

The movement of the main drum by means of operating levers will render it operative at  
 15 high or low speed and in its normal inoperative position, will run as an idler on the shaft 11. It will assume this latter position when the line is being unwound and hauled out by the operation of the trip drum.

The apparatus is of special advantage in logging operations, where the engine is located in a certain place to clear up a given area and it is necessary to adapt the mechanism for handling all the timber within that  
 25 area, both large and small. Machines of this kind, as generally constructed, have only one gear ratio and if the engine is adapted for handling heavy logs, there is a great surplus of power in handling the lighter logs  
 30 and if the engine is run at a high speed for the purpose of speeding up the drum, then there is danger of breakage, unusual or abnormal wear of the running parts, and unnecessary waste of fuel for surplus steam  
 35 production.

I am aware that friction drives are not new and that there is nothing essentially new in the gearing between the drum and the drive shaft, but the combination of the  
 40 idle main drum with the gears and pinions for varying the speed of the drum, I believe to be new in engines of this type.

I claim as my invention:

1. In a logging engine, the combination  
 45 with a drive shaft and a pinion keyed thereon, of a main drum shaft a gear secured thereon and meshing with said pinion, a drum loosely mounted on said drum shaft and hav-

ing a friction clutch connection with said gear, a gear rim mounted on said drum, a  
 50 second pinion loosely mounted on said drive shaft and having a clutch connection therewith, said second pinion being of less diameter than said first named pinion and meshing  
 55 with said gear rim, whereby said drum may be driven at a high speed with light power, or a slow speed with great power

2. The combination with a drive shaft and a pinion secured thereon, of a trip drum shaft having a gear meshing with said pinion,  
 60 a trip drum having a clutch connection with said gear, a main drum shaft and a gear thereon meshing with said drive shaft pinion, a main drum loosely mounted on said main drum shaft having a friction clutch connection  
 65 with said main shaft gear, a gear mounted on said main drum and a second pinion smaller than said first named pinion mounted on said drive shaft and meshing with the  
 70 gear on said main drum, and said second pinion having a friction clutch connection with said drive shaft.

3. In a logging engine, the combination with a frame, of a drive shaft, having a crank disk and a pinion secured on said shaft, a  
 75 main drum shaft and a large gear secured thereon meshing with said drive shaft pinion, a main drum loosely mounted on said main drum shaft and having a clutch connection with said gear whereby said drum may be  
 80 operated at a comparatively high speed, a gear mounted on said drum, a pinion of less diameter than said first named pinion, loosely mounted on said drive shaft and meshing with said drum gear and having a  
 85 friction clutch connection with said drive shaft, whereby said drum may be operated at a high speed and with increased power, substantially as described.

In witness whereof, I have hereunto set  
 90 my hand this first day of December 1908.

WILLIAM HARRISON CORBETT.

Witnesses:

MORTON H. INSLEY,  
 ELIJAH CORBETT.