

H. N. COVELL & J. H. DICKINSON.

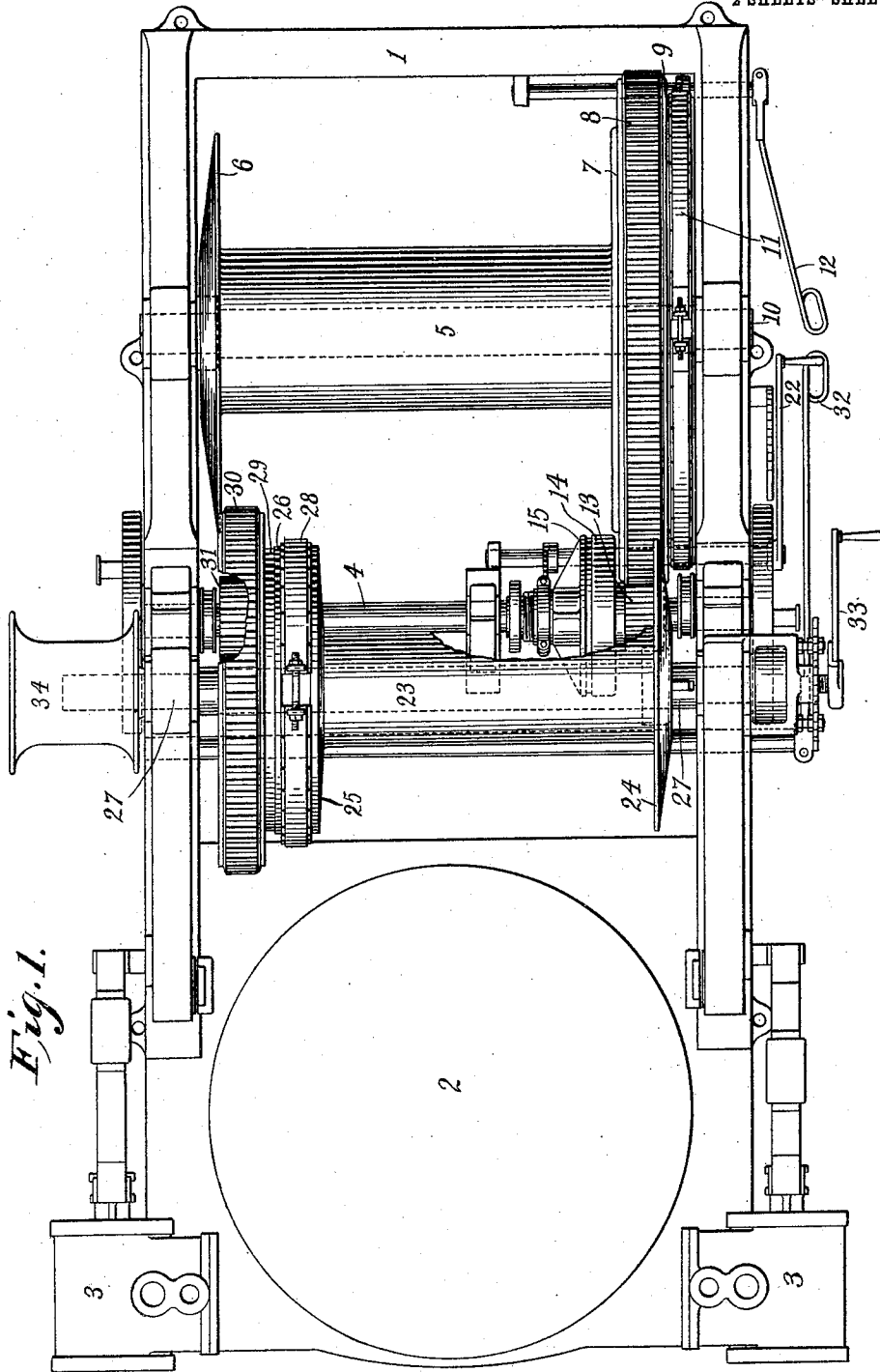
ROAD ENGINE.

APPLICATION FILED APR. 5, 1906.

933,825.

Patented Sept. 14, 1909.

2 SHEETS—SHEET 1.



Witnesses
Raphaël better
Jos. J. Pierando

Inventors:
H. N. Covell
J. H. Dickinson
By their Attorneys: Rifford & Full

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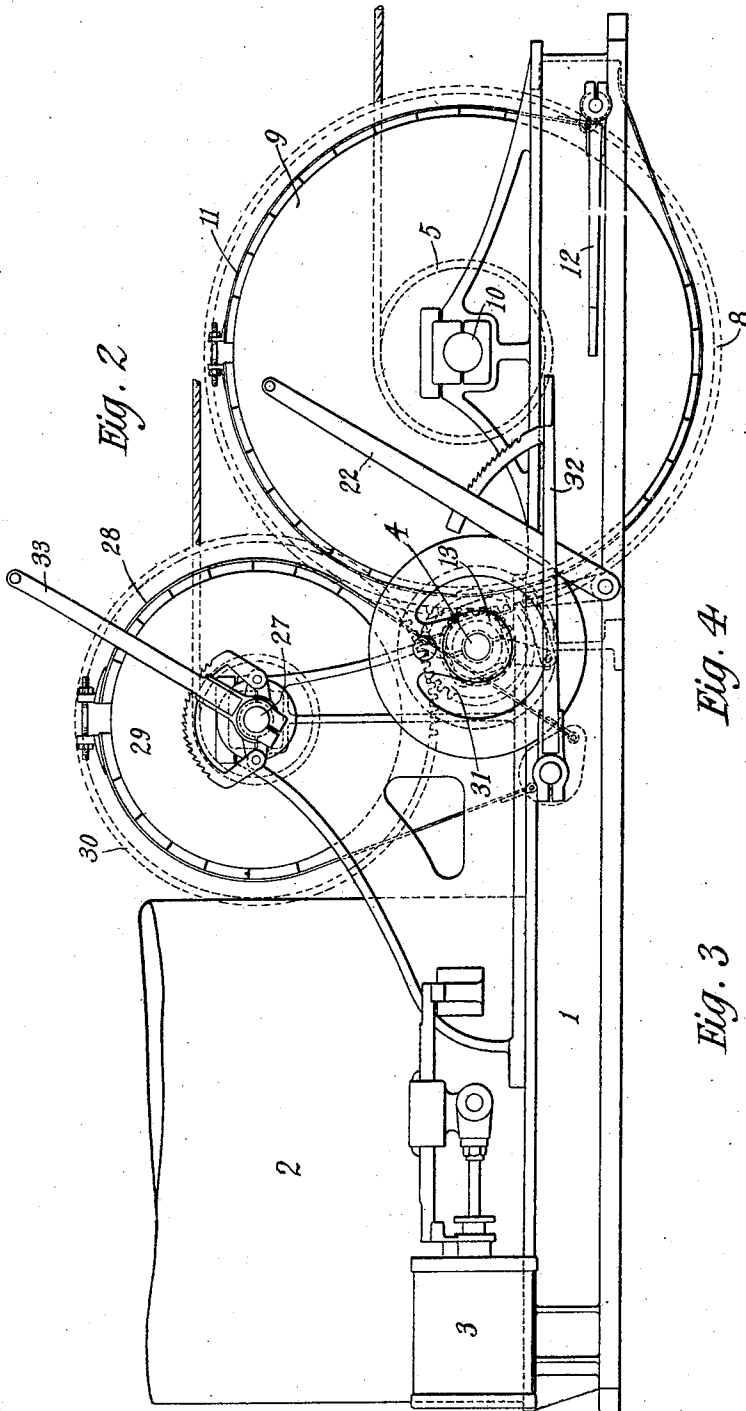


Fig. 2

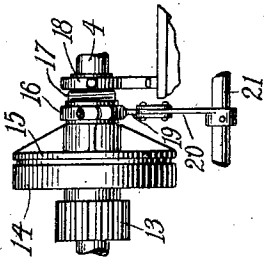
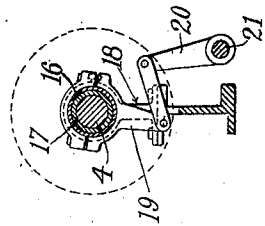


Fig. 4



Witnesses
Raphael Vetter
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Inventors:
Harry N. Covell
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By their Attorneys Clifford & Hall

UNITED STATES PATENT OFFICE.

HARRY N. COVELL, OF BROOKLYN, NEW YORK, AND JOSEPH H. DICKINSON, OF MONTCLAIR, NEW JERSEY; SAID COVELL ASSIGNOR TO LIDGERWOOD MANUFACTURING COMPANY, A CORPORATION OF NEW YORK.

ROAD-ENGINE.

933,825.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed April 5, 1906. Serial No. 310,044.

To all whom it may concern:

Be it known that we, HARRY N. COVELL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, and JOSEPH H. DICKINSON, a resident of Montclair, in the county of Essex and State of New Jersey, have invented certain novel and useful Improvements in Road-Engines, of which the following is a specification.

This invention is applicable to what is technically known as a "road engine" which is a rope-drum engine designed for pulling logs long distances, frequently over a mile.

It generally consists of a large powerfully geared pulling or inhaul drum which is the forward drum and a speeded outhaul drum, which is the back drum. A special road engine is sometimes built of two outhaul drums making three drums in all.

The road engine does not gather logs at the point where the tree is cut down. The logs are brought to the pulling line of the road engine by yarding engines or other methods and the road engine then pulls one log or several logs known as a "turn of logs" to the landing where they are loaded upon the cars thus requiring a very long, powerful and steady pull. The work required of these road engines is peculiar. It is obliged to handle two ropes, one of which, the inhaul or pulling rope, is for hauling in the logs and is frequently a mile or more in length, which if an inch in diameter and a mile in length, will weigh over 8000 pounds. The other, or outhaul rope, passes around a distant pulley and is required to outhaul the pulling or inhaul rope together with log grabs and connections to the point at which the logs are taken. This outhaul rope has to be double the length of the inhaul rope and is of relatively small size.

When the inhaul rope is wound upon the drum, its enormous weight together with the weight of the drum, frequently makes a combined weight of over 14000 pounds, even with a road engine of small size, upon the drum bearing and great difficulty has been experienced under these circumstances from the wearing out of the bearings. The enormous pull required of this drum necessitated that it be geared for great power and this has heretofore imposed such an extreme

strain upon the friction and for such extended lengths of time, as to require special appliances for preventing the friction from slipping and preventing the friction setting mechanism from heating. Another difficulty has been in the size of the inhaul drum to attain the necessary high speed of outhaul and also the friction between the inhaul drum and its oppositely rotating shaft during the outhaul operation.

The object of our present invention is to obviate, severally and collectively, the above mentioned difficulties in this class of engines.

Our invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the annexed drawings wherein we have illustrated one embodiment of our invention, Figure 1 is a plan view of a road engine embracing our improvements; Fig. 2 is a side view of the same; Fig. 3 is a detail view partly in section of the mechanism for operating the clutch on the power shaft; Fig. 4 is a detail view of such power shaft clutch and the drive pinion connected thereto.

In the accompanying drawings, 1 is the frame; 2 the boiler; 3, the cylinders, and 4, the crank shaft of the engine, the other details of which are omitted.

5 is the inhaul drum containing the flanges 6 and 7 and fixed to the spur wheel 8 and the brake wheel 9. These constitute substantially a unitary structure keyed to the shaft 10 which revolves in bearings on the frame. Since the space between the frame bearings is occupied only by the drum and its flanges and the spur wheel and brake wheel, the drum may be made of maximum length so as to accommodate the long rope which it is called upon to handle. Since the bearings for the shaft 10 of this drum are stationary bearings upon the frame, the friction is due only to the motion between a moving and stationary part and the bearings can be lubricated in the best manner. Therefore, the friction in wear and tear produced by the enormous weight of the drum and its contained rope is reduced to a minimum.

11 is a narrow brake-band cooperating with the brake-wheel 9 and operated by the lever 12. For driving the spur wheel 8 and its inhaul drum 5, we provide the pinion 13

upon a sleeve rotatably mounted upon the crank shaft 4 and fixed to this pinion is the friction clutch member 14 cooperating with the inverse clutch member 15 splined to the crank shaft 4. For setting and unsetting the friction members 14, 15, we prefer to employ a nut 16 screwthreaded to a collar 17 on the shaft 4, which collar bears against the fixed abutment 18. The nut 16 is oscillated by the arms 19 and 20 from the shaft 21 which is controlled by the hand lever 22.

In practice, the spur wheel 8 and pinion 13 will be geared down as low as about 7—1 so as to obtain great pulling power. Since the friction connection 14, 15 is interposed between the shaft 4 and the pinion 13 instead of between the drum 5 and its spur wheel 8, we can increase the diameter of the friction clutch 14, 15, to any extent desired beyond the diameter of the pinion and can, therefore, avoid the necessity of severe pressure in setting the clutch to make it hold and, therefore, avoid the friction which has heretofore produced so much difficulty in the clutch setting mechanism. In practice, we prefer to make the diameter of the clutch 14, 15, about three times that of the pinion 13. The outhaul drum 23, its flanges 24 and 25 and clutch member 26 are rotatably loose upon the drum shaft 27 and are held by the brake band 28. The inverse clutch member 29 and spur wheel 30 to which it is connected are keyed fast to the shaft 27 and are driven by the pinions 31 keyed fast to the crank shaft 4. 32 is the lever by which the brake band 28 is set, and 33 the lever by which the drum is thrust endwise so as to set the friction clutch 26, 29.

By having the spur wheels 30 and 8 driven from separate pinions, the ratio between the spur wheel 30 and the pinion 31 may be regulated to secure any desired high speed for the drum 23, and thus with a small circumference of the drum 23 and a correspondingly cheap and light weight drum, the requisite high speed of outhauling may be attained. If desired, a winch head 34 may be fixed on the end of the shaft 27 outside the frame.

Among the many advantages of our road engine may be set forth the following: 1. It is powerful where power is required and speedy where speed is required. 2. By transferring the friction clutch from the drum shaft 10 to the shaft 4, the drum 5 can be made longer, the bearings upon which the drum 5 rotates are simplified and rendered comparatively frictionless and the clutch is enabled to dominate the movements of the drum with less clutch setting pressure and less friction in the clutch setting mechanism and the registering of the clutch members is unaffected by any wear in the bearings carrying the enormous weight of the drum 5 and its rope. 3. The diameter and weight

of the outhaul drum 23 may be reduced to a minimum and still the requisite high speed of outhaul be maintained. 4. These road engines are, in use, mounted upon a sled and by our construction, the friction clutch is relieved from the weight of the inhaul drum and its rope in case the sled leans toward the friction side.

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

1. An engine, comprising an outhaul drum, an inhaul drum, a power shaft, means carried by said power shaft for placing such shaft in and out of driving engagement with the inhaul drum, and means carried by the outhaul drum for placing the latter in and out of engagement with the power shaft.

2. An engine comprising an out-haul drum, an in-haul drum, a gear wheel for said in-haul drum and pinion clutch mechanism interposed between said drums and adapted to be placed in and out of operative engagement with the in-haul drum.

3. An engine comprising an outhaul drum, an inhaul drum, a power shaft, a friction clutch on the power shaft for connecting and disconnecting the latter and the inhaul drum, and a friction clutch mechanism carried by the outhaul drum for connecting and disconnecting the latter and the power shaft.

4. An engine, comprising a plurality of drums each having a relatively large gear wheel, said gear wheels being arranged at opposite ends of their respective shafts, a power shaft, pinions carried by said power shaft for engagement with said gear wheels respectively, clutch mechanism carried by the power shaft for placing one of said pinions in and out of driving engagement with one of said gear wheels, a clutch mechanism carried by the drum having the other gear wheel for placing such drum in and out of engagement with said power shaft.

5. An engine comprising an outhaul drum and an in-haul drum, a power shaft interposed between said drums, a gear for each of said drums and arranged at opposite ends, pinions carried by the power shaft and meshing with the gears of the drums, a friction clutch mechanism on the power shaft for placing one of said pinions in and out of driving engagement with the adjacent gear wheel of the in-haul drum, and clutch mechanism carried by the out-haul drum for placing said out-haul drum into and out of driving engagement with the power shaft.

6. An engine having a drum formed with a relatively long rope bed, a second drum having a relatively short rope bed, a power shaft, clutch mechanism carried by said power shaft for placing the latter in and out of driving engagement with the drum having a relatively long rope bed, a clutch mechanism carried by the drum with a rela-

tively short rope bed, for placing the latter in and out of driving engagement with the power shaft.

7. An engine, having a drum member provided with a relatively long rope bed, a second drum having a relatively short rope bed, a power shaft, means for connecting said power shaft with the drum having the relatively long rope bed to drive the latter at a comparatively low speed and with comparatively great power, and means for connecting said power shaft with the drum having a relatively short rope bed to drive said drum at a comparatively high speed and comparatively low power.

8. An engine having two drums, one having a relatively long rope bed and the other a relatively short rope bed, a power shaft, frictionally operated power multiplying mechanism for connecting said power shaft with one of said drums, and means for connecting said shaft with the other of said drums.

9. An engine having an inhaul drum, an outhaul drum, a power shaft, a gear wheel for each of said drums, pinions on said power shaft for meshing with said gear wheels, and frictionally operated power multiplying mechanism carried by said power shaft for placing one of said pinions on the power shaft in driving engagement with the gear wheel of the in-haul drum to operate the inhaul drum.

10. An engine comprising two drums, a gear wheel carried by each of said drums and at opposite ends, a power shaft, pinions on said power shaft for engagement with said gears, a friction clutch on said shaft for placing one of said pinions into and out of operative engagement with the gear, braking mechanism located on the outside of one of said gears and braking mechanism located inside of the gear of the other drum.

11. An engine comprising two drums, a power shaft, a gear wheel for each of said drums, clutch mechanism on said power shaft adapted to be shifted into and out of operative engagement with one of said gear wheels, and a band brake located on the outside of said gear.

12. An engine comprising a drum member, a second drum member and a drum shaft fast therewith and mounted to turn in bearings on the bed of the engine, a power shaft, gears for each of said drums, pinions carried by said power shaft and meshing with said gears, friction clutch mechanism mounted on said shaft and adapted to place one of said pinions in and out of driving engagement with an adjacent gear, and clutch mechanism carried by one of the drums for placing the adjacent pinion into and out of driving engagement with said drum.

13. An engine comprising an inhaul drum and an outhaul drum, said inhaul drum being keyed fast to a drum shaft revolving in bearings on the bed of the engine, a power shaft, a pinion carried by said power shaft adapted to be placed in and out of engagement with the gear of the inhaul drum, and frictionally operated mechanism for actuating said pinion.

14. An engine, having a drum formed with a relatively long rope-bed, a second drum formed with a relatively short rope-bed, a gear wheel for each drum, means coacting with said gears for driving the drums, a braking device for one of said drums arranged outside the gear wheel thereof, and a braking mechanism for the other drum located at a point inward of the gear of said drum.

15. An engine having a rope-drum formed with a relatively long rope-bed, a second drum formed with a relatively short rope-bed, means for driving one of said drums at comparatively high speed and with relatively low power, and means for driving the other drum at comparatively low speed and with relatively high power.

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

HARRY N. COVELL.
JOSEPH H. DICKINSON.

Witnesses:

R. B. CAVANAGH,
WALTER A. PAULING.

It is hereby certified that in Letters Patent No. 933,825, granted September 14, 1909, upon the application of Harry N. Covell, of Brooklyn, New York, and Joseph H. Dickinson, of Montclair, New Jersey, for an improvement in "Road-Engines," an error appears in the printed specification requiring correction as follows: Page 1, line 59, for the word "inhaul" read *outhaul*; and that the proper correction has been made in the files and records of the Patent Office, and is hereby made in said Letters Patent.

Signed and sealed this 26th day of October, A. D., 1909.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.