

(No Model.)

2 Sheets—Sheet 1.

W. E. COLE.

LOCOMOTIVE.

No. 277,994.

Patented May 22, 1883.

Fig. 1.

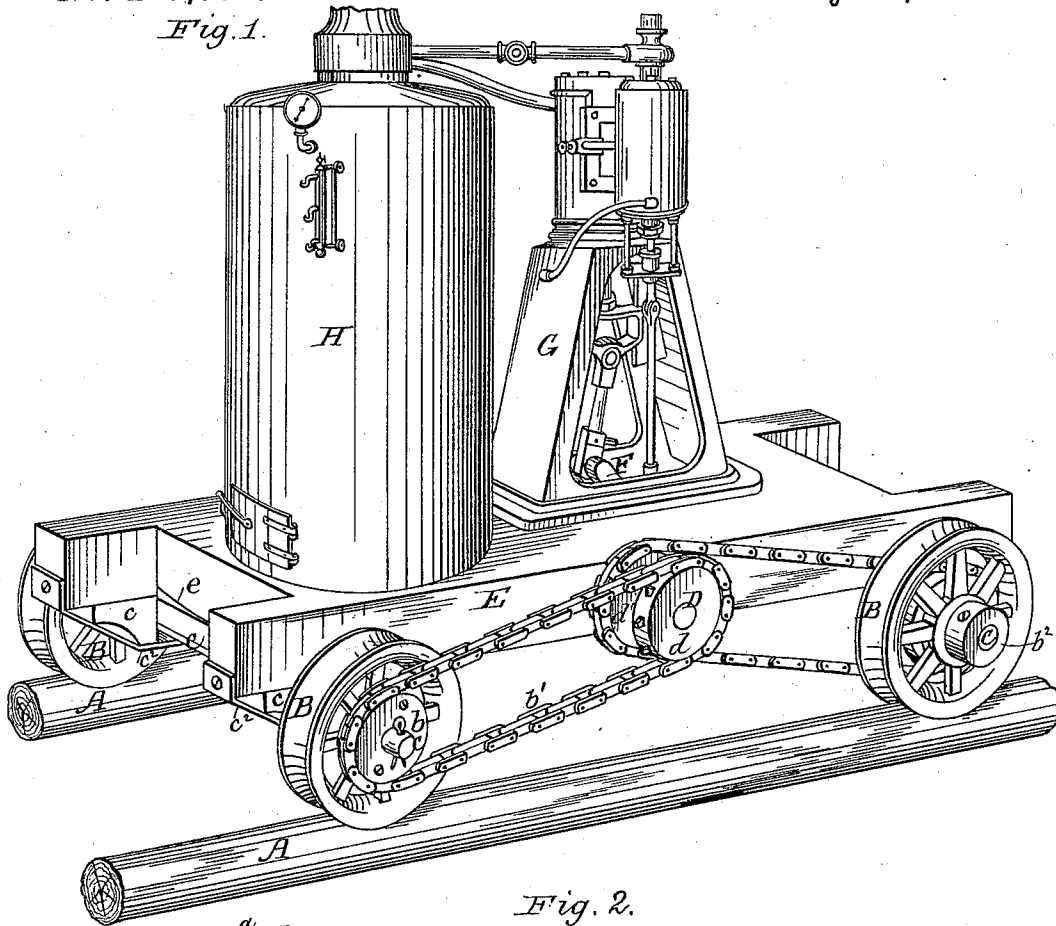
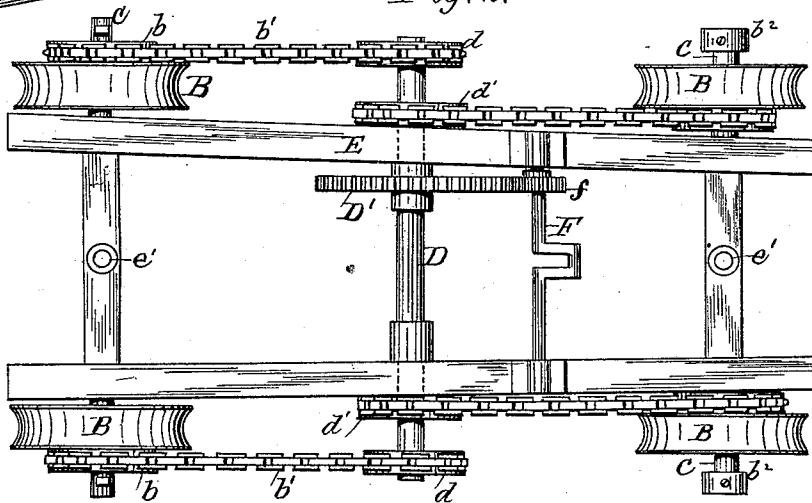


Fig. 2.



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Inventor:

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Fig. 3.

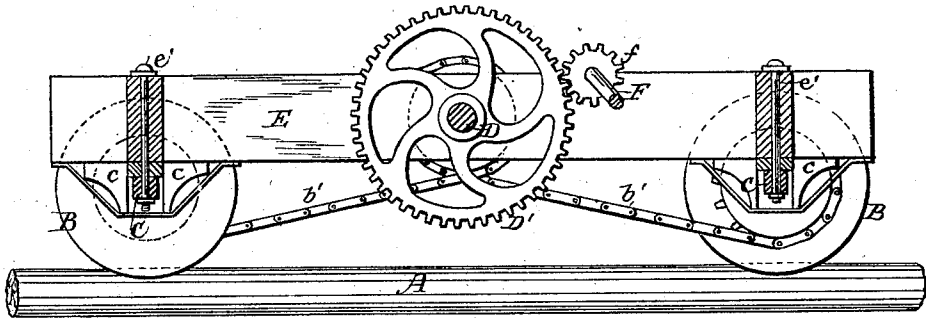
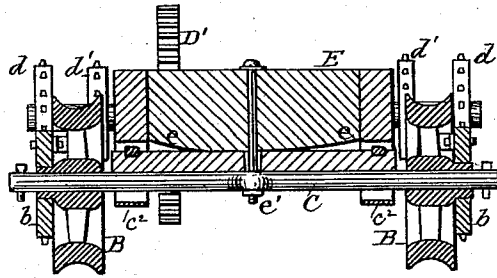


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM E. COLE, OF MONTGOMERY, ALABAMA.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 277,994, dated May 22, 1883.

Application filed March 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD COLE, a citizen of the United States, residing at Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Pole-Road Locomotives, of which the following is a specification.

My invention relates to improvements in locomotives that are driven from the engine by means of endless chains passing over sprocket-wheels secured to the driving-shaft and to the axle of the supporting-wheels; and the object of my improvements are, first, to provide a locomotive adapted to travel upon rough tracks made of poles laid end to end upon the ground, in which tracks cross-ties are dispensed with; second, to provide flexible means for connecting the four driving-wheels with the motive power, and also to permit said motive power to be rocked and moved laterally upon the carrying-wheels. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the locomotive, with the water-tank and fuel-box removed. Fig. 2 is top view of the truck, with the boiler and engine removed therefrom. Fig. 3 is a longitudinal vertical section of the same, and Fig. 4 is a transverse vertical section of the same.

Like letters indicate like parts in all the figures.

A A represent poles or logs, which are laid end to end in two parallel lines to form a track, as is customary in lumber districts, said track being without cross-ties, and from the nature of the material and the absence of any careful preliminary grading, unevenness, variable gage, and other irregularities always exist, so that to adapt cars and locomotives to be used with practicable success on such a track certain peculiarities in the constructing of the rolling stock are necessary. To provide a locomotive which shall adapt itself to the necessary irregularities in the distance from each other that the poles or logs may be set at different points in the track, by reason of crooks in the logs, and to render each of the traction-wheels effective in its function of draft and security upon the rails or logs, I groove said wheels and drive each independently of all the others, and permit longitudinal movement of each upon its

axle. To be more specific, each of the wheels B is loosely journaled upon the axle C, and in practice the axle projects beyond the wheel at each end about four inches, thus allowing for eight inches variation in the gage of the track. Said wheels are retained upon the axle by suitable means, such as nuts, linchpins, or a collar, *b*². The wheels being grooved, as shown, lateral curvature in either rail or log acts to move the wheel longitudinally upon the axle, and this movement necessitates a flexible connection with the motive power. I therefore secure to the spokes of each wheel a sprocket, *b*, preferably fitting the hub of the wheel exteriorly, and drive said sprocket by a chain, *b'*, passing over a sprocket, *d*, secured to the counter-shaft D, which extends across the frame E, and is provided with a master-gear, *D'*, which is driven by a pinion, *f*, secured to the crank-shaft of an engine mounted on the frame. In this instance I have shown an upright engine, G, and boiler H; but I do not wish to be understood as limiting myself to any particular kind or class of engines or boilers, as others can, with ordinary mechanical skill, be adapted to the end in view. Each of the wheels being driven independently and directly from a single shaft, it will be seen that if all the sprockets are placed on the outer sides of the wheels said driving-shaft would necessarily be long enough to receive and operate the two required sprockets outside of the frame, and, furthermore, the alignments of the sprocket-chains could not be preserved without an excessively long shaft, which by being thus lengthened would be also in the same degree weakened or more liable to spring and become bent. I therefore arrange the sprockets of the front wheels of the truck upon the inner sides of said wheels, and the sprockets of the rear wheels upon the outer sides and the sprocket upon the driving-shaft are located so that upon a straight track the chains are in true lines parallel with each other, and the wheels occupy a medium position on their axles, with liberty to move thereon in either direction. This disposition of the sprocket leads to a peculiarity in the construction of the frame E, in that its forward end is narrower than its rear end, in order that room shall be made for the forward sprocket-wheels.

I would here remark that the terms "front"

and "rear," as applied to the ends of the frame, are relative, and may be interchangeably used. Either end may be narrower than the other, and the inner sprocketed wheels may be at the narrower end whether it be front or rear.

By the construction thus far described it will be seen that each of the wheels is positively driven, and will perform its function of draft so long as it is driven, without regard to the active work of any of the other wheels, as in case of breakage of one or more of the chains; but the remaining wheel or wheels are positively operating, and locomotion is uninterrupted.

Obstructions, depressions, and unevenness in the poles or tracks, together with other usual imperfections therein, require some essential features in the locomotive-frame for practical operation. I therefore make provision for independent movement of any one of the wheels vertically without altering to an injurious extent the general level of the frame, whereby the boiler and engine are caused to ride more smoothly than would otherwise be the case. To accomplish this I curve the under surface of those cross-beams of the frame which ride upon the axles C, as shown at *e*, Figs. 1 and 4, and connect them to the axles by a bolt, *e'*, arranged centrally and fitting somewhat loosely a hole in the axle, not for the purpose of a pivotal connection, but to prevent movement of the frame longitudinally upon the axle. Furthermore, depending pedestals or brackets *c* are secured to the side beams of the frame in front and rear of the axle, at each end, to prevent pivotal movement thereof about the bolt *e'* as a center, but to permit a vertical movement of each side of the frame—that is, to allow the frame to rock upon the axles; and straps *e²*, passing under the brackets and axles strengthen the former and prevent undue movement of the latter. Rubber or other springs may also be used between the ends of the curved beams and the axles.

Suitable coupling-links may be provided whereby cars constructed like the truck or frame E, but without means of locomotion, may be drawn by the locomotive herein shown.

Not only may changes in the character of the engine and boiler be made without departing from my invention, but other means of connection between each of the wheels and the motor may be employed, and, so far as driving each of the wheels independently of the others is concerned, the construction of the truck may be materially different from that shown and described, so that in these and other like particulars I do not confine myself, but deem such variations as comprehended by my invention.

Having described my invention and its operation, what I claim as new is—

1. The combination of the poles A and the locomotive-frame E, provided with grooved wheels B, each having a free longitudinal play upon the axle at all times, substantially as specified.

2. The combination of the locomotive-frame having cross-beams curved upon their under surfaces, as at *e*, and resting upon the axles, and having depending brackets *c*, with the axle C and grooved wheels B, having at all times a free longitudinal play thereon, substantially as specified.

3. The combination of a locomotive-frame provided with wheels having at all times a free longitudinal play upon the axles thereof, and means for driving each of the wheels independently of the others, with chains, substantially as specified.

4. The combination of a frame, a motor mounted thereon, a pair of sprockets mounted on each end of a shaft connected to said motor, and a front and rear wheel, each provided with a sprocket arranged on relatively-opposite sides of said wheels, and chains connecting the sprockets of the shaft, and of the wheels having a free longitudinal play upon the axle, substantially as specified.

5. The combination of a boiler and engine, front and rear wheels having respectively inner and outer sprockets secured thereon, with a frame narrower at the front, and having a shaft bearing sprockets and located between said wheels, and with independent chains connecting said shafts with the inner and outer sprockets, substantially as described.

6. The combination of the engine C and a frame, E, having grooved wheels B, each having a free longitudinal play upon their axle, and a sprocket, *b*, and connected by a chain, *b'*, to a shaft, D, adapted to be rotated by said engine, substantially as described.

7. The combination of the truck E, having curved cross-beams *e*, pedestals *c*, and straps *e²*, with the axle C and loosely-journaled wheels B, having at all times a free longitudinal play upon the axles, substantially as described.

8. The combination of the engine G, boiler H, crank-shaft F, pinion *f*, gear D', shaft D, sprockets *d* *d'*, frame E, axles C, wheels B, sprockets *b*, and chains *b'*, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM EDWARD COLE.

Witnesses:

E. E. MASSON,
L. C. HILLS.