

D. H. BALL.
Traction Engines.

No. 139,997.

Patented June 17, 1873.

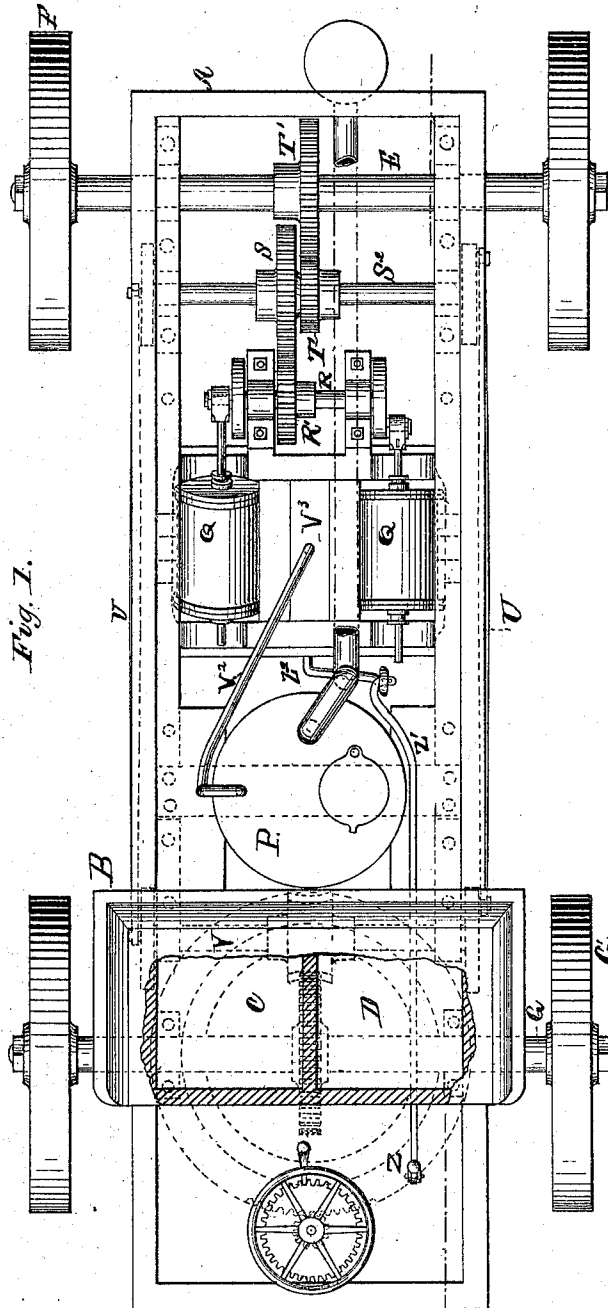


Fig. 1.

Witnesses:

J. C. Brecht.
Wm. J. Peyton

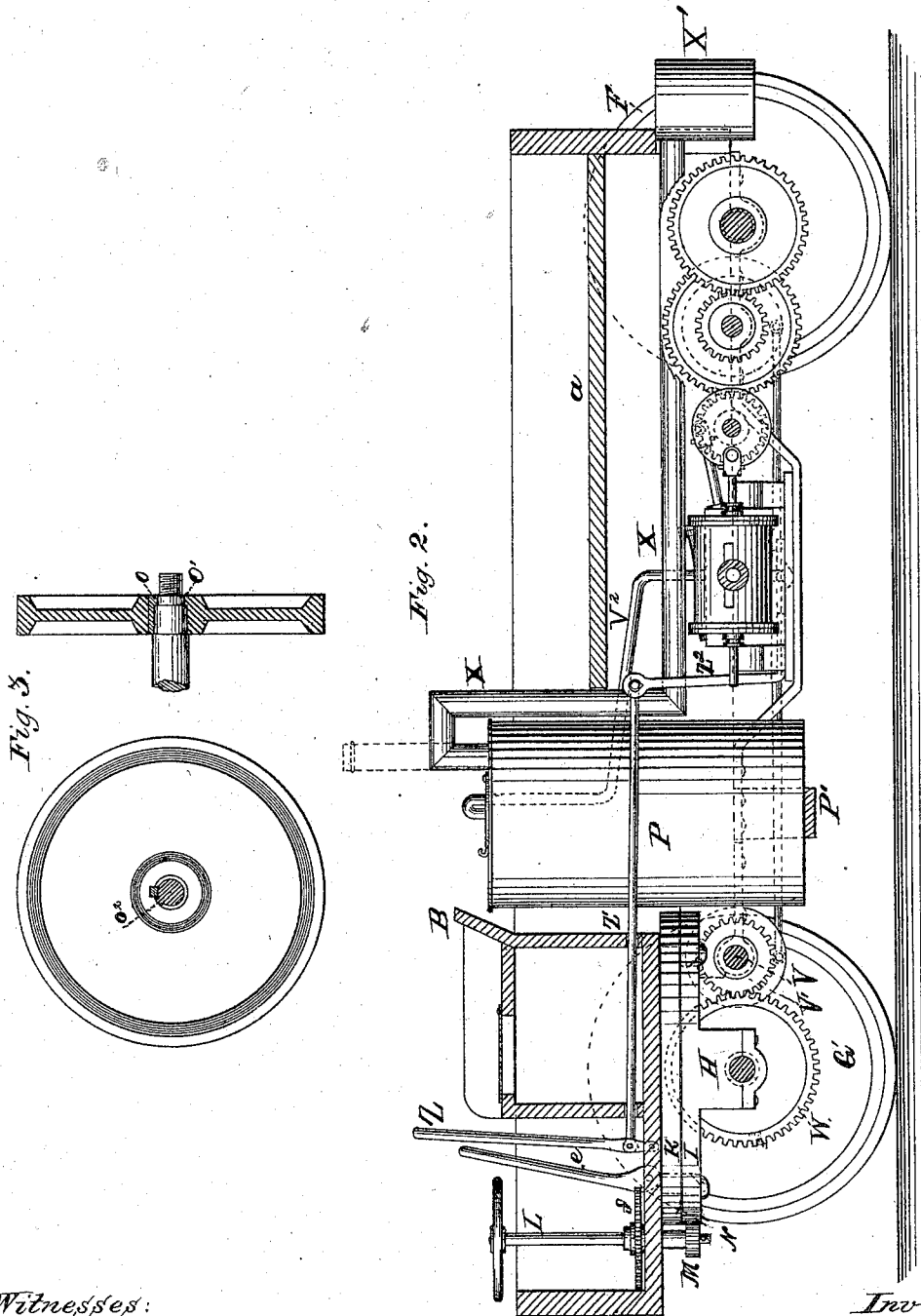
Inventor:

David H. Ball,
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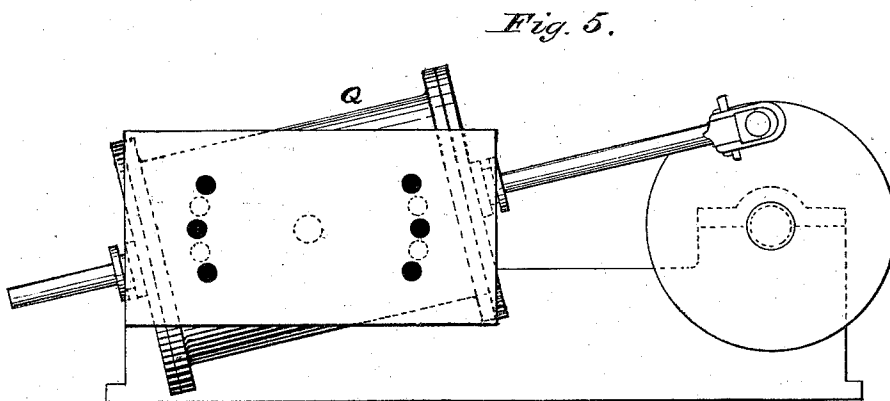
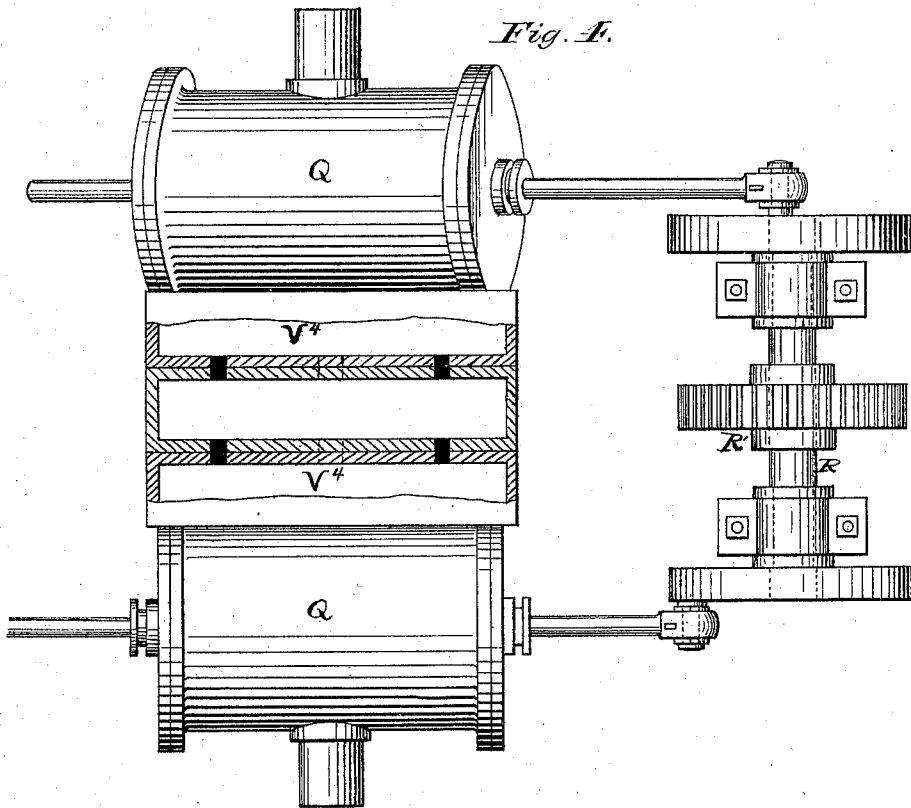
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David H. Ball
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UNITED STATES PATENT OFFICE.

DAVID H. BALL, OF SINNAMAHONING, PENNSYLVANIA.

IMPROVEMENT IN TRACTION-ENGINES.

Specification forming part of Letters Patent No. **139,997**, dated June 17, 1873; application filed March 31, 1873.

To all whom it may concern:

Be it known that I, DAVID H. BALL, of Sinnamahoning, in the county of Cameron and State of Pennsylvania, have invented certain new and useful Improvements in Steam Road-Wagon, of which the following is a specification:

This invention relates to an improvement in steam vehicles or traction-engines used on common roads for drawing loads, and generally for other purposes requiring portable engines; and it has for its object to so construct and arrange the component parts as to best secure strength, speed, and power combined with safety of the various operative parts and to this end the invention relates, first, to an improved arrangement of engines and transmitting-gearing for operating both the front and rear axles of the vehicle upon which the traction-wheels are mounted; and it consists in the relative arrangement of two oscillating engines with intermediate shafting and gearing for transmitting a rotary movement to the axles and wheels of the engine, as will be hereinafter more fully described. The second feature of the invention consists in applying the traction-wheels loosely to their axles, so that when the wagon is turned they will make nearly a revolution independent of the axles in order to prevent slipping; a projection on the axle, and a key on the wheel, limiting or arresting the independent movement of the wheels when the carriage is moving forward in a straight line.

In the accompanying drawings, Figure 1 is a plan or top view of the traction-engine embodying my invention. Fig. 2 is a side elevation, partly in section. Fig. 3 is a detail view of the traction-wheel and axle. Fig. 4 is a plan view, partly in section, of the engines and steam-chest. Fig. 5 is a side elevation, with one engine removed.

The frame or body A of the wagon is of any desired form or construction, and may be provided in certain instances with a protective canopy or top. At the front end of the frame is arranged the engineer's or conductor's seat B, which is made to form two compartments, C D, for the reception of water and fuel, and the boiler supplies, admission being had to the compartments through doors in the seat-board

as shown, or otherwise. A pivoted dog or pawl, e, serves, in connection with a spur-disk, f, on the shaft L, as a medium for retaining the latter, together with the circle-plate, in a stationary position. The rear axle E of the wagon is journaled loosely so as to permit its rotation in suitable boxes, and is provided with the traction-wheels F, which may be either plane-faced, corrugated, or provided with rubber or elastic tires, as the exigencies of the case may require. The front axle G, carrying the wheels G', is journaled in hangers or boxes H, projecting downward from a circle-plate or fifth-wheel I, which is free to operate in frictional contact with a correspondingly-shaped stationary plate K, secured to the under side of the carriage-body. A vertical shaft or windlass, L, extending through the floor of the wagon in front of the engineer's seat, has attached to its lower end a pinion, M, which meshes or gears into a segmental rack, N, on the circle-plate I, so that by turning said shaft the direction of the wheels can be changed, thus placing the wagon under perfect control of the engineer. It is obvious that the axle-boxes may rest on springs, or that the latter may be arranged in any other suitable manner for counteracting the effects of uneven roads. The traction-wheels F G', either or all, but generally only the front ones, are mounted loosely on their axles, and are susceptible of revolving independently when the carriage is turning, so as to prevent slipping, this result being effected by inserting into the hub of the wheel a key or gib, O, the front end of which travels on the reduced portion O¹ of the axle, which is provided with a projection, O², which serves as a stop, or limits the independent movement of the wheel after the same has made nearly a full revolution, locking or causing the wheels to revolve with their axles when the carriage is moving in a straight direction. In rear of the seat for the engineer is arranged a vertical boiler, P, supported by means of a skeleton frame or cradle P', and provided with necessary appendages and the usual devices for generating steam. The operative or propulsive power is derived from two oscillating engines, Q, of the usual construction, the piston-rods of which are connected by wrist-pins and eccentrics, or otherwise, to a short transverse

shaft, R, which carries a spur-wheel, R', meshing into a larger pinion, S, on an intermediate shaft, S², which serves to directly transmit the propelling force to the rear axles and traction-wheels through the medium of the gear-wheel T T', applied, respectively, to the shaft S² and rear axle. The front axle of the wagon is operated from the same prime motor as the rear one, by means of connecting-rods U U, which are attached to eccentrics on the shaft S² and on a front shaft V. Said shaft is provided with a central pinion, V¹, with the pitch of the teeth increased laterally so as to always maintain the same in gear with a spur-wheel, W, on the front axle, which is necessary, as the position of the latter is constantly changed in order to change the direction of the progress of the wagon. The smoke from the boiler is conducted to the rear of the wagon by means of a pipe or flue, X, having its various sections arranged at angles to each other, as shown, and extending horizontally below the covered portion or rear platform a, to the rear end where it is attached to a perforated water receptacle, X', for arresting the sparks, or to a casing containing an exhaust-fan. If deemed expedient an auxiliary vertical smoke-flue may be resorted to, as shown in the dotted lines, Fig. 2, either alone or in connection with the branched pipe. Steam is conducted from the boiler by means of a pipe, V², into a steam-chest, V³, common to both engines, which is arranged between two valve-chests or chambers, V⁴, provided with a suitable number of

ports or openings at both ends, which are caused to register alternately with corresponding openings in the steam-chest, so as to admit the steam at the opposite end of the cylinder when it is desired to reverse the action of the engines for moving the wagon in an opposite direction. The steam-chest is moved vertically for changing the position of the various parts, by means of a lever, Z, arranged near the engineer's seat, and connected by means of a rod, Z¹, to an elbow lever or arm, Z², the lower portion of which is attached to the bottom of the steam-chest.

Having thus fully described my invention, what I claim is—

1. In a steam road-wagon or traction-engine, the combination of one or more oscillating engines, with the connecting-rods U U, and shaft V, for operating both the front and rear axles of the traction-wheels, substantially as set forth.

2. The wheels of a steam road-wagon loosely mounted upon the axles, and adapted to have a movement independent of one another by means of the key O, the reduced portion O¹, and projection O², substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 28th day of March, 1873.

DAVID H. BALL.

Witnesses:

JAMES L. NORRIS,
WM. J. PEYTON.